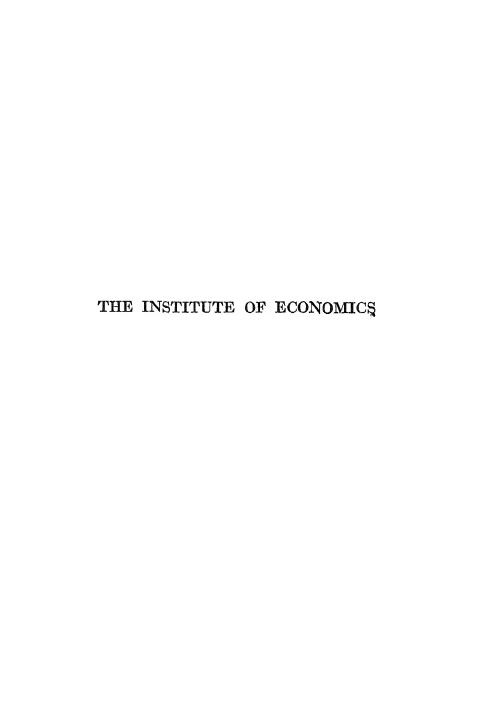


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THE BALANCE OF BIRTHS AND DEATHS

VOLUME I
WESTERN AND NORTHERN EUROPE

BY

ROBERT R. KUCZYNSKI

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1928

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DIRECTOR'S PREFACE

For more than a century the rate of population growth has been a subject not only of interest but of concern to students of the social sciences. At the opening of the nineteenth century, Malthus' Essay on the Principle of Population focussed the attention of the world upon the inevitability, as he saw it, of over-population as the result of a law of growth - population tending to increase in geometric ratio and the means of subsistence tending to increase only in arithmetic ratio. In the Occidental world, however, the discovery and settlement of vast and rich new areas and a revolution in economic methods have permitted a remarkable rise in the standard of living since Malthus' day, notwithstanding the continuous increase in population. But it remains true that over-population is still regarded not only in Asia but also in many European countries as a primary cause of economic distress.

Meanwhile, the growing practice of birth control has given rise to the fear in some quarters that the present danger is not that the population will increase too fast, but rather that it will not long be maintained. Meanwhile, also, the markedly varying rates of population increase in different countries and in different areas of the world have occasioned another set of fears — lest this or that particular nation or particular race will cease to hold its place in the eternal scheme of things.

Existing population literature does not afford the answer to such fundamental questions as: In what countries of the world is population still amply reproducing itself? In what countries is the population ceasing to maintain itself? The mere citation of figures concerning the ratio of births and deaths does not afford the answer. Close analysis of fertility and mortality is required if one is to ascertain the trend of population in the different countries of the world.

In this volume, which is concerned with the countries of Western and Northern Europe, the Institute of Economics presents the first of a series of studies intended to be a comprehensive survey of the trend of human fertility. A second volume dealing with Southern and Eastern Europe, Africa, and Asia is expected to be published in the spring of 1929, and a third covering North and South America and Australia early in 1930. These three volumes will be confined to a statement of the facts, but subsequent studies will be devoted to an analysis of the social causes and the economic and political consequences of the great differences in fertility which exist between countries like England, France, Germany, the United States, and Australia, on the one hand, and Poland, Russia, Japan, and South America, on the other.

The preparation of this volume has been under the supervision of a Committee consisting of the Director of the Institute, and Charles O. Hardy and Constantine E. McGuire of the Institute staff. The author desires to express his obligations to Dr. Johannes Rahts, former chief of the population division of the German Statistical Office, for many

valuable suggestions and to the librarians of the Surgeon General's Office, the Bureau of Labor Statistics and the Department of Commerce for facilities in consulting statistical documents.

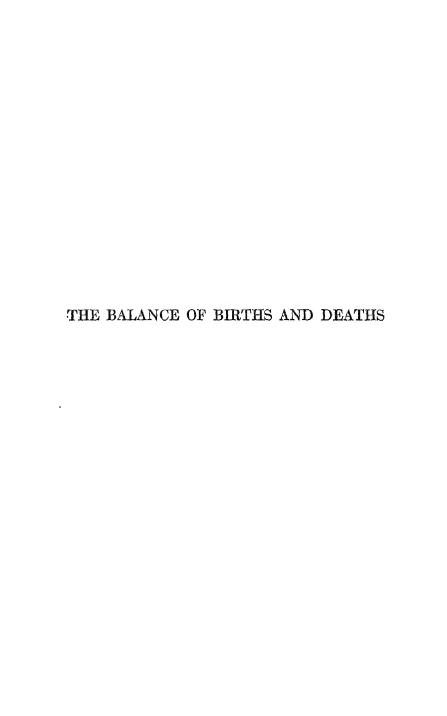
HAROLD G. MOULTON,

Director.

Institute of Economics, July, 1928.

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THE BALANCE OF BIRTHS AND DEATHS

INTRODUCTION

A NEW book on the population problem? And one which will confine itself solely to stating the facts without attempting to explain them? Are there really any worthwhile new facts to state? Do we not know perfectly well that mortality has decreased practically everywhere in the course of the last hundred years and that natality has fallen in Western Europe and elsewhere in the course of the last forty or fifty years, that there is an excess of births over deaths practically everywhere, and that population will necessarily increase so long as births exceed deaths? Yes, know all this perfectly well, so well indeed that we are dy to characterize as foolish any person who would , retend that a nation with a large excess of births over death's may still be dying out. Yet such an assertion would not only not be foolish but would even be much to the point today.

It has indeed not been sufficiently realized so far that, however low may be the number of deaths, there must be a definite and rather considerable number of births in order to insure the reproduction of the population. Even if Isaiah's vision became true that "the child shall die an

hundred years old," it would still be necessary that or the average each woman have two children who in turn become parents of two children, etc., if the population were not sooner or later to decrease.

Let us, for a moment, consider England which in 1927 had 655,000 births and 485,000 deaths. It may seem at first sight that an excess of 170,000 births is a proof of considerable vitality and it may even be assumed that by further improvements in public health the number of deaths might still be reduced Yet, incredible as it may sound, those 655,000 births of 1927 mean that on the average each woman during her life-time gives birth to but two children, and that if the population is to hold its own not one of the children thus born may die before attaining parenthood. In case then that natality does not again increase, the population of England is bound to die out no matter how low mortality may be reduced. And this state of affairs is by no means confined to England. Conditions are about the same in Germany, and only slightly better in France.

Therefore, a new book on the population problem which will merely state the facts may not be superfluous.

The unusual angle from which this book attacks the population problem necessitates the application of unusual methods. These methods had to be explained. They car be explained and have been explained without quoting any mathematical formula. The author even feels sur that the understanding of those methods does not presum any mathematical training on the side of the reader. If,

then, any reader possessing a high-school education does not understand the methodological explanations given in this book, it will neither be the fault of the reader nor of the high-school, but the fault of the author. Yet, there may be readers who do not care at all about statistical methods and are interested merely in the principal results. For those readers a brief summary of the results will be given here.

Around 1850, 3½ million children a year were born in Western and Northern Europe. Fifty years later the annual number of births was 4¾ millions. At present it is again about 3½ millions. In the meantime, the population has considerably increased: from 113 millions in the middle of the nineteenth century to 189 millions in 1927. The birth rate, that is the number of births per 1,000 inhabitants, therefore has considerably decreased: from 1841 to 1885, it averaged about 32; by 1913 it had fallen to 24; in 1927 it was 18 only. The decrease of the birth rate began in France but involved sooner or later every country so that there is no longer any marked difference between the birth rates of the various parts of Western and Northern Europe.

Forty or fifty years ago, the average number of children born to each woman (married and unmarried) was four or five mail countries of Western and Northern Europe, with the exception of France and Ireland, where it was about three. In 1926 it was practically everywhere below three and averaged out 2.3.1 Part of the children, of course, die herore reacting marrying age. Forty or fifty years ago,

4 THE BALANCE OF BIRTHS AND DEATH

the number of children born to each woman and becoming parents in their turn averaged about three in all countries of Western and Northern Europe with the exception of France and Ireland, where it was about two. In 1926, the number of such children was still above two in some of the smaller countries, like Holland, Denmark, and Finland, but it was below two in all the larger countries: in France and especially in England and Germany.

If each woman has two children who become parents in their turn, the population will hold its own. If she has three such children, the population will increase by one-half within one generation. If she has less than two such children, the population will sooner or later decrease. With a fertility and a mortality as they prevailed forty or fifty years ago, the population then would have increased by about one-half per generation in all countries of Western and Northern Europe with the exception of France and Frefand, where the population about held its own. With a fertility and a mortality as they prevail at present, the population of some smaller countries still shows a genuine growth, but the population of the larger countries, France, and especially England and Germany, is doomed to die out.

CHAPTER I

BIRTH RATES

It is generally believed that natality in most countries of Western and Northern Europe was about constant until the end of the third quarter of the nineteenth century. While it is admitted that vital statistics exhibit an increasing natality in England in the forties, fifties, and sixties of the nineteenth century, this fact is usually disposed of by pointing to improvements in the registration of births.1 Even granted that every increase of the official birth rate in earlier periods is to be explained by a more thorough registration, it certainly would be impossible to account for decreases in the official birth rate by decreases in the efficiency of registration. As a matter of fact the countries which have statistics for the twenty-five years following the Napoleonic wars (Denmark, Finland, France, Prussia, Norway, Sweden) all show a decrease of natality during that period, and ups and downs are still more conspicuous if one goes back to the scanty statistics covering the period from 1735 to 1815.2

The decline of the birth rate which began in the last quarter of the nineteenth century proved to be a continuous one. The

¹ See for example Newsholme, Sir Arthur, The Elements of Vital Statistics, New Edition, 1923, pp 92-93.

² See tables, pp. 6, 94.

VEARLY BRTH RATES BY PERIODS, 1736-1927

SWEEZ- ERLAND	l	ı	}	i	l	1	!	١	1	1	1	ı	1	1	1	1	1	i	ł	í	ı
Sweden	1	1	35.14	37.1	34.3	346	338	313	34.7	318	32.1	339	328	314	304	329	33.7	35.8	33.5	32.4	30.6
Nor- way	30.0	200	31.5	344	343	35.3	33.5	29 ₹	308	29 9	30.7	33.5	32 30	282	268	27.1	32.7	33 7	32.9	31.2	38
Hol. Land	1	1	1	1	1	1	1	1	1	1	1	i	1	1	1	1	1	1	1	1	35 16
GER- MANY (2)	1	I	1	1	ı	I	I	1	ı	1	1	ı	1	1	1	1	1	1	1	ļ	ı
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France (2)	1	ļ	1	1	1	ŀ	ı	1	J	1	1	1	1	1	1	1	1	1	1	ı	i
FRANCE F	1	1	ı	ì	1	1	1	1	1	1	1	l	1	!	31.7	31.7	320	314	30.5	29 6	28.4
Fin- LAND	ŀ	}	1	453	\$5	437	417	388	413	404	37.5	411	392	384	343	370	37.7	38.7	378	342	30.6
IRE- LAND	1	1	ı	I	1	ļ	I	1	1	ļ	1	I	1	1	ı	1	1	1	I	1	1
Scor- LAND	1	1	f	1	ļ	1	1	ļ	I	i	1	ı	I	ı	1	1	ļ	i	1	ŀ	1
ENGLAND AND Wales	١	1	ł	1	1	1	1	1	1	1	١	١	1	1	1	1	1	{	1	1	3, 36
Den- Mark	I	j	Į	I	J	i	ļ	1	1	1	1	1	29 99	32.3	303	30.8	324	32.2	299	308	200
Векстом	1	ı	1	1	1	1	ı	1	I	I	1	i	1	1	1	1	ı		1	331	34.2
Perion	1736-40	1741-45	1746-50	1751-55	1756-60		2, 1766-70	1771-75	1776-80	1781-85	1786-90	1791-95	1796-1800	1801-05	1806-10	1811-15	1816-20	1821-25	1826-30	1831~35	1836-40

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1841-45 1846-45 1856-65 1856-65 1856-65 1856-70 1851-75 1871-7	(1) Terri

decrease in the late seventies and the early eighties was not greater than had occurred at numerous previous occasions.³ The birth rate in 1881-85 was comparatively low in Great Britain, Ireland, France, Sweden. But it was higher than 1846-55 in Belgium and in Switzerland; higher than 1801-15, 1821-55, 1861-80 in Denmark; higher than 1806-10, 1831-40, 1846-50, 1866-70 in Finland; higher than 1841-60 in Germany and in Holland; higher than 1736-45, 1771-90, 1801-15, 1836-50, 1866-75 in Norway. If we combine all countries of Western and Northern Europe (taking them with their present territory), we find that the birth rate in that territory was still 31.4 in 1881-85 as compared with 31.9, 30.9, 30.8, 31.7, 32.1, 32.0, 32.7, and 32.8 in the eight preceding quinquennial periods. The decisive factor then was that the decrease of the birth rate did not stop in the eighties. If we again combine the countries of Western and Northern Europe (taking them this time not with their present but with their pre-war territory), we find that the birth rate which had fluctuated between 31.3 and 34.2 from 1872 to 1886 dropped below 31 in 1887 and never reached 31 It fell definitely below 30 in 1897, below 29 in 1903, below 28 in 1905, below 27 in 1909, below 26 in 1910, and below 25 in 1911. The second half of the eighties has then to be considered as the turning point in the

³ A decrease of the birth rate like that from 1751-55 to 1771-75 in Sweden (37.1 to 31.3) and Finland (45.3 to 38.8), or that from 1791-95 to 1806-10 in Finland (41.2 to 34.3) and Norway (33.5 to 26.8), or that from 1821-25 to 1836-40 in Sweden (35.8 to 30.6), Norway (33.7 to 28.1), and Finland (38.7 to 32.6), or that from 1836-40 to 1846-50 in Belgium (34.2 to 28.6), finds no parallel in the period from 1871 to 1885.

trend of the birth rate. The decrease was slow up to the beginning of the twentieth century and the absolute number of births still increased until 1901. The decrease of the birth rate became ever more rapid from 1909 on and the absolute number of births in 1914 was smaller than in any of the 40 preceding years.

The World War did not essentially change the trend of the birth rate. During the war, the birth rate was very low, being 17.0 only in 1915-19 as compared with 24.2 in 1911-

POPULATION, BIRTHS, AND BIRTH RATES, 1841-1926 *

	==	=	===	=	==			
	Per	TOD				MEAN POPULATION (in thousands)	Average Yearly Births	Birth Rate
1841-45 1846-50 1851-55 1856-60 1861-65 1866-70 1871-75 1876-80 1881-85 1886-90 1891-95 1896-1900 1901-05 1906-10 1911-14 1915-19 1920-21 1922-23 1924-25						109,170 112,464 114,451 117,179 121,620 125,475 128,702 134,634 139,760 144,700 150,049 157,140 164,998 172,726 179,507 180,212 181,342 183,947 186,645	3,480,648 3,472,880 3,523,544 3,714,050 3,899,311 4,016,593 4,209,905 4,416,136 4,385,320 4,372,226 4,460,828 4,616,319 4,686,460 4,590,764 4,336,742 3,063,521 4,320,368 3,865,617 3,712,743	31.9 30.9 30.8 31.7 32.1 32.0 32.7 32.8 31.4 30.2 29.7 29.4 28.4 26.6 24.2 17.0 23.8 21.0
1926 .	•	٠	•	•	•	188,267	3,612,720	19.2

^{*}Present territory of Belgium, Denmark (incl. Faroe Islands and Iceland), Great Britain (incl. Islands in the British Seas) and Northern Ireland, Irish Free State, Finland, France, Germany, Saar Territory, Holland, Luxemburg, Norway, Sweden, Switzerland.

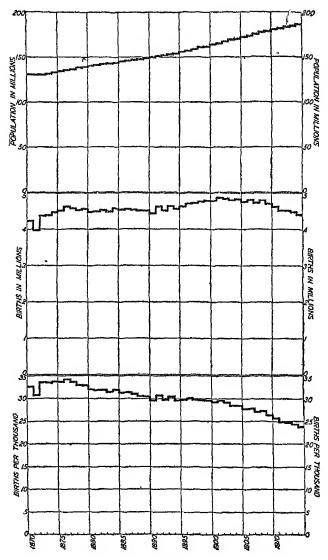
		=	=	==	_				
		Yı	EAR.		•		MEAN POPULATION (in thousands)	Births	-Birts Rate
1870							129,692	4,233,145	32.6
1871	•	•	٠	•	•	•	129,673	3,969,437	30.6
1872	•	•	•	•	•		130,318	4,366,342	33.5
1873	•	•	4	•	•	•	131,400	4,382,797	33.4
	•	•	•	•	•				
1874	-	•	•	•	٠	٠	132,577	4,467,832	33.7
1875	٠	•		•	٠	-	133,855	4,511,576	33.7
1876	•	•	•	•	٠	•	135,120	4,618,746	34.2
1877	•		•	•	٠	•	136,423	4,584,723	33.6
1878					•	٠	137,759	4,532,950	32.9
1879		•				٠	139,031	4,560,436	32.8
1880		٠				•	140,096	4,481,508	32.0
1881							141,002	4,485,551	31.8
1882							141,888	4,515,407	31.8
1883							142,754	4,488,713	31 4
1884							143,726	4,571,146	31.8
1885							144,732	4,535,358	31.3
1886							145,812	4,558,239	31.3
1887							146,846	4,536,608	30.9
1888	·				Ċ	•	147,904	4,508,620	30.5
1889	•	Ē	•	Ť	•	Ċ	149,030	4,514,984	30.3
1890	•	•		•	•	:	149,995	4,437,081	29,6
1891	•	•	•	•	٠	•	150,974	4,622,490	30.6
1892	•	•	•	•	•	•	152,039	4,519,832	29.7
1893	•	•	•	•	•	•	153,122	4,650,227	30.4
1894	•	•	•	•	•	•	154,387	4,573,737	29.6
1895	•	•	•	•	•	•	155,762	4.641.038	29.8
1896	•	•	•	•	٠	•	157,273	4,719,176	300
1897	٠	•	•	•	•	•	158,898	4,734,765	29.8
1898	•	•	•	•	٠	•			
1899	•	٠	•	•	•	•	160,684	4,774,851	29.7 29.6
	•	٠	٠	٠	•	•	162,332	4,802,802	
1900	٠	-	•	•	•	•	163,738	4,796,910	29.3
1901	٠	٠	•	٠	•	•	165,303	4,886,568	29.6
1902	٠	•		•	•	•	166,971	4,869,567	29.2
1903	•	٠		•	•	•	168,578	4,806,484	28.5
1904	•	٠	•	٠	•		170,173	4,847,001	28.5
1905		•			•		171,744	4,769,769	27.8
1906				•	•		173,331	4,817,093	27.8
1907	•			•			174,895	4,737,266	27.1
1908							176,562	4,801,893	27.2
1909		*					178,208	4,709,187	26.4
1910		,					179,810	4,626,365	25.7
1911						,	181,289	4,507,434	24.9
1912		,					182,679	4,511,440	24.7
1913				,			184,143	4,472,880	24.3
1914							185,695	4,403,422	23.7
							-	-,,	

^{*}Pre-war territory of Belgium, Denmark proper, Great Britain (excl. Islands in the British Seas) and Ireland, Finland, France, Germany, Holland, Norway, Sweden, Switzerland.

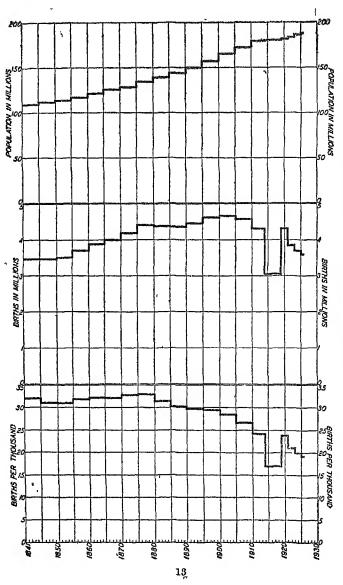
1914. Immediately after the war, the contraction of many marriages which had been postponed caused the birth rate to rise temporarily. It reached 23.8 in 1920–21; but it fell again: to 21 0 in 1922–23, 19.9 in 1924–25, and 19.2 in 1926.4 Although the population of Western and Northern Europe had increased from 109 2 millions in 1841–45 to 188.3 millions in 1926 or by 72 per cent, the number of births in 1926 (3,613,000) was practically the same as the average in 1841–45 (3,481,000).5

The decrease of the birth rate did not start at the same time in every country. It began in France and in Ireland earlier than in all other countries so that since about the forties of the nineteenth century there has been a marked difference between the birth rates of the various countries of Western and Northern Europe, the rate of Germany always having the lead while the rates of France and Ireland always lagged behind. These conditions continued into the first decade of the twentieth century. As late as 1906-1910, the German birth rate, although it had in the meantime gone down rapidly, still led with 31.6, Finland being second with 30.9, Holland third with 29.6, and Ireland and France lowest with 23.3 and 19.9. But in the last years before the war a conspicuous trend towards similarity of the birth rates took place. Holland, Germany, and Finland, it is true, still occupied the first three places in 1913, but their birth rates had dropped to 28.3, 27.5, and 27.2 respectively, and in eight other countries, including Ireland, the rate varied between 22.5 and 25.6 only, while in France it was 18.8. During the war, the birth

⁶ In 1927, it was about 18.2. ⁶ In 1927, it was about 3,450,000.



POPULATION, BIRTHS, AND BIRTH RATES IN WESTERN AND NORTHERN EUROPE, 1870-1914



Population, Births, and Birth Rates in Western and Northern Europe, 1841-1926

rate was of course especially low in the belligerent countries, and the recovery in 1920-21 did not affect all countries with the same intensity. But as early as 1921, the trend towards equality in rates again set in, and the birth rates, if one excludes Holland, varied only as follows.

> In 1921 between 25 3 and 20 7 " 1922 23 5 " 19 3 " 1923 23 7 " 18 8 " 1924 22 4 " 18 1 " 1925 " 22 3 " 17 5 " 1926 " 217 " 169

Holland occupied the first rank in each year since 1913 France was at the bottom of the ladder until 1919 and again in 1921 and 1922, but her birth rate exceeded that of Switzerland in 1920, 1925, and 1926, that of Sweden in 1923-26, that of England and Wales in 1925 and 1926 Ireland too had completely changed her position. While in 1913 her birth rate exceeded only that of France and Belgium, the fact that the Irish birth rate subsequently assumed a virtually stationary level had the result that in 1926 it was higher than in any other country except Holland and Finland

Not much stress should be laid on the birth rates in small countries. The usual comparison of small with large countries is indeed rather misleading. Holland still has a considerably higher birth rate than any other country of Western and Northern Europe. In 1925, for example, it was 24.2 as compared with 20.7 in Germany. But while Holland, with a population of 7,366,000 had 178,545 births. the four eastern provinces of Germany, with an aggregate population of 7,100,000, had 178,009 births or about as many as Holland, and the birth rate for this territory was 25.1 as compared with 24.2 for Holland. On the other hand, the birth rate in 1925 was in Switzerland 18.4, in Sweden 17.5, and in the Free State of Saxony 17.7, the populations being 4, 6, and 5 millions respectively. If the large countries then were subdivided so as to admit adequate comparison with the small countries, the position of the smaller countries would no longer appear extreme. Such a subdivision is indeed necessary for all studies entering into details. For a study of the problem in general, the increasing uniformity of the birth rates in the various countries leads to another alternative: combine a group of countries in order to eliminate divergencies of little significance occurring in small countries.

CHAPTER II

FERTILITY RATES

THE birth rate shows the percentage by which a population increases through the birth of children, but since it is calculated without regard to the sex and age composition of the population it does not afford an adequate gauge for the measurement of fertility. If in a given population the percentage of women of child-bearing age is large, the birth rate is likely to be high even if fertility is small; while if the percentage of women of child-bearing age is small, the birth rate is likely to be low, even if fertility is large. The fact that England during the last generation before the war had a higher birth rate than Sweden, although the number of births per 1,000 women of childbearing age was larger in Sweden, is thus explained by the higher percentage of women of child-bearing age in England. It therefore has become customary to measure fertility by relating the number of births to the number of women of child-bearing age. If, then, child-bearing age is assumed to cover the period from 15 to 50 years,1 the general fertility rate is the number of births per 1,000 women of 15 to 50 years.

The general fertility rate, on the whole, has followed the same trend as the birth rate. If the percentage of women

¹ See Appendix B.

of child-bearing age among the total population were always and everywhere the same, say 25, per cent, the general fertility rate would always and everywhere be four times as large as the birth rate. This is, of course, not the case, but the percentage of women of child-bearing age among the total population actually varies much less than one might expect in view of the enormous differences in distribution of populations by age and sex. The lowest percentage ever ascertained for any country of Western and Northern Europe was that of 23.88 in Ireland for 1871, while the highest percentage before the war was that of 27.69 in England for 1911. These extreme differences, of course, seem rather high; but if one combines all the countries of Western and Northern Europe (with their pre-war territory), the percentage of women of childbearing age was as follows:

> 1860: 25.89 1870: 25.40 1880: 25.03 1890: 25.29 1900: 25.70 1910: 25.89

While it may be instructive to study the general fertility rate for individual countries, it, then, seems superfluous to compute such rates for the whole of Western and Northern Europe in pre-war times. If the percentage of women of child-bearing age was 25.89 both in 1860 and in 1910, the fertility rate must have decreased in 1910 as compared with 1860 in exactly the same proportion as the birth rate.

Women of Child-Bearing Age Per Cent of Total Population, 1750-1925

SWITZER- LAND	26.90 26.90 26.13 25.55 25.80 26.02 26.02
Sweden	25.88 25.29 25.29 25.29 25.39 26.39
Norway	25.75 24.95 25.50 25.50 24.73 24.73 24.74 24.34 24.34 24.34 24.34 24.34
Ноглано	25.83 26.09 25.25 24.03 24.42 24.82 24.82 24.82
GERMANY	25.42 25.06 24.97 25.03 25.03 25.03 25.03 25.03 25.03
France	25.99 25.99 25.47 25.65 25.65 25.85 25.85 25.85 25.87 25.87 25.87
FINLAND	24.00 25.24 26.02 26.02 26.02 26.02 25.62 25.62 25.62 25.62 25.62 25.63 24.50 24.50 24.50
IRELAND	25.72 23.88 24.45 24.46 25.74 26.60
Scotland	26.79 26.46 25.64 25.64 25.72 25.72 26.63 26.71
ENGLAND AND WALES	25.39 25.47 25.47 25.47 25.47 27.47 27.69 28.27 28.27
Denmark	25.82 25.82 25.82 25.82 25.82 25.82 25.40 24.97 24.30 24.30 24.91 24.31 24.31 25.02 25.02
Belgium	25.16 25.36 25.36 24.44 24.49 23.95 24.49 25.35 25.35
YEAR ABOUT	1750 1775 1800 1825 1840 1845 1855 1855 1855 1875 1875 1885 1875 1885 1875 187

Since 1915, the general fertility rate has decreased much more than the birth rate The percentage of women of child-bearing age has increased indeed in all countries of Western and Northern Europe, and this mainly because, on account of the fall of the birth rate, the percentage of children has decreased Combining all the countries of Western and Northern Europe (with their present territory), the percentage of women of child-bearing age in 1920 was It probably has increased somewhat in the subsequent years since the percentage of children has continued to decrease materially Assuming that in 1926 the percentage of women of child-bearing age was 28, the birth rate of 19.19 per 1,000 in Western and Northern Europe would correspond to a fertility rate of $\frac{1919}{28} = 685$ per 1,000. Assuming, on the other hand, that in 1911-14 the percentage of women of child-bearing age was 26, the birth rate of 24.16 would correspond to a fertility rate of $\frac{2416}{26}$ = 929. While the birth rate from 1911-14 to 1926 has decreased by 21 per cent, the fertility rate has decreased by 26 per cent.

The general fertility rate indicates how much the women of child-bearing age add to the population through births, but since it is calculated without regard to the specific age composition of the women in child-bearing age, it does not after all afford an adequate gauge for the measurement of the actual fertility of those women. If among the women of child-bearing age the percentage of women between 25 and 35 years is large, the general fertility rate is likely to

be high even if the specific fertility in each age group may be low, while if the percentage of women between 25 and 35 is small, the general fertility rate is likely to be low even if the specific fertility in each group may be high. The fact that Norway in 1890–91 had almost the same general fertility rate as 15 years earlier although the fertility in almost each age group decreased considerably is thus to be explained by the increased percentage of women between 25 and 35. It, therefore, becomes necessary to compute specific fertility rates by age of mothers.²

Fertility rates for the individual years of age would then seem to afford a perfect measure of fertility as a whole. But the result appears cumbrous since it involves the consideration of about 40 different fertility rates. The prob-

² The author, in an address to the Fourteenth International Congress on Hygiene and Demography, held in 1907, emphasized the inadequacy of the general fertility rate by stating:

"How little the general fertility rate affords a measure for the fertility in the different years of age may be illustrated by a comparison of conditions in Sweden and in Berlin. In Sweden, in 1891-1900, 115 children were born per year to each 1,000 women of child-bearing age; in Beilin. in 1896-1900, 91 children. The general fertility rate in Beilin lagged behind that of Sweden by 21.2 per cent. A comparison of the proportion between the children born and the women of child-bearing age in the different years of life shows that in Berlin the figures increase up to the 25th year only, in Sweden however up to the 30th year. In Berlin, the rates in the earlier years of life are, without exception, higher than in Sweden: Berlin's lead, however, diminishes as the age increases, and in the 25th year, when, in Berlin, the peak of fertility is reached, there are already somewhat more births to each 1,000 women in Sweden than there are in Berlin. Sweden's preponderance then grows constantly: at 35 years Sweden's rate is twice as high, at 40 years it is three times as high, at 43 years four times as high, at 46 years five times as high as that of Berlin. The difference between the general fertility rate in Sweden and that in lem, however, how to fuse those different annual rates into one numerical expression is easy to solve. All that is necessary is to add the different specific fertility rates. The sum thus obtained — which we may call the total fertility — indicates indeed exactly how many children would be born to 1,000 women arriving at the age of child-bearing, with fertility as it is and if none of those 1,000 women died before having passed through child-bearing age. Simple as this solution is, it seems to have escaped general attention. So far as the author is aware it was first proposed at the International Congress on Hygiene and Demography of 1907 3 when, in discussing the fertility rates of Sweden for 1891–1900 and of Berlin for 1896–1900, he recommended:

... to ascertain how many births to each thousand girls arriving at the age of child-bearing would have occurred in each of those two territories, if their number had not been reduced at all by

Berlin would evidently be larger if the more fertile age groups among the women of child-bearing age were not—largely under the influence of immigration—more amply represented in Berlin than in Sweden."

The basic data for this comparison between Sweden and Berlin are given in the table on page 22, cols. 1, 3, 5, and 7. Attention should perhaps be called to the fact that the Swedish confinement rates (col. 5) are not entirely comparable with the Berlin fertility rates (col. 7) since each confinement is counted only once even if it yields twins, etc. But the source of error, of course, is not considerable: the 1,354,225 confinements of the decade resulted in 1,374,118 births.

⁸ See "Bericht ueber den XIV. Internationalen Kongress fuer Hygiene und Demographie," Berlin, September 23–29, 1907, Vol. III, pp. 1472–1484; reprinted in Jahrbuecher fuer Nationaloekonomie und Statistik, Third Series, Vol. XXXV, pp. 229–241. See also Willcox, Walter F., "Statistics at the Fourteenth International Congress on Hygiene and Demography," Quarterly Publications of the American Statistical Association, September 1912, Vol. XIII, pp. 223–225.

FERTILITY RATES BY YEARS OF AGE IN SWEDEN AND IN BERLIN

			Swe	DEN			Berlin
Vears Of Age	Mean N of Fer		Confine per Y		Confine per 1,000		Live- and Still-Born per 1,000
	1891-1900	1901-10	1891-1900	1901~10	1891-1900	1901-10	Females ⁵ 1896–1900
12 13 14 15 16 17 18 19 21 22 24 25 26 27 28 29 20 21 22 22 24 25 26 27 28 29 20 20 21 21 21 21 21 21 21 21 21 21 21 21 21	49,492 48,677 47,689 46,478 45,150 43,808 42,479 41,116 30,587 37,977 36,574 35,625 34,511 33,439 33,581 33,439 33,582 33,732 32,637 32,637 32,638 32,638 33,732 33,732 34,716 36,716 36,716 36,716 36,716 37,716 38,716 38,716 38,717 38,717 39,716 30,716 30,716 30,716 30,716 30,716 30,716 30,716 30,716 31,716 32,716 32,716 32,716 32,716 33,718 33,718 33,718 34,716 36,716 37,716 38,716	52,551 52,237 51,376 50,435 49,378 48,165 44,564 43,563 44,564 44,564 43,563 44,431 39,435 38,503 37,647 36,874 36,009 31,209 31,209 31,209 31,209 31,209 31,209 31,209 31,209 31,209 31,209 31,209 31,209 31,209 31,209 31,207 31,209	0.3 3.2.2 21.4 102.0 35.0 9.849.6 1,641.2 5,541.7 45.097.2 5,687.9 6,151.1 6,477.2 6,883.4 6,963.9 6,833.9 6,833.9 6,833.9 6,833.9 6,833.9 1,102.8 4,183.0 2,135.0 4,183.0 2,135.0 1,103.0 1,1	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	0 01 0.07 0.45 2.19 7.90 19.39 38.64 7 116.82 139.37 159.66 175.77 187.69 207.34 208.26 207.39 197.85 186.13 154.31 141.90 119.83 1154.31 141.90 333.68 18.73 33.68 18.73 0.05 0.01	0.00 0.02 0 11 0.67 3.33 11.23 26.32 48.28 73.66 100.26 125.09 146.24 163.76 187.13 197.39 196.33 193.39 196.33 193.39 196.33 171.74 164.36 171.74 171.75 171.74 171.75 17	0.37 1.40 5.69 17.75 36.52 58.31 136.98 151.78 170.18 170.21 172.15 168.63 156.63 126.63 125.63 125.64 94.14 93.48 76.33 73.05 58.81 47.82 33.85 27.46 19.26 0.11 1.26 0.12
Total			135,422.5	138,224.4	4,074,42	3,832.30	2,797.86

^{*}See Sundbärg, Gustav, ''Fortsatta Bidrag till en Svensk Besolkningsstatistik för Åren 1750-1900,'' Statistisk Tidskrist 1907, p. 277; Sveriges Officiella Statistik, Besolkningsförelsen Översikt för Åren 1901-1910, p. 42*.

b See Statistisches Jahrbuch der Stadt Berlin, Vol. XXVII, p. 83.

deaths and if consequently the number of women at each year of age between 15 and 50 had been the same. If, with this purpose in view, one adds the fertility rates of the individual years of life, computed by relating the births to the number of living women, one will find for Sweden 4,134° and for Berlin 2,798 births per 1,000 women who reach child-bearing age. If the influence of mortality is excluded from consideration, fertility then appears by 32.3 per cent smaller in Berlin than in Sweden.

It may seem surprising nowadays that such an analysis which while proving the inadequacy of the general fertility rate showed so simple a way of accurately measuring fertility did not attract any interest at the time it was made. ·One must, however, remember on what phases of vital statistics interest focussed twenty years ago. At that time the excess of births over deaths was higher in most countries than ever before. Mortality had decreased at a stupendous rate and since the number of surviving children was exceptionally large, the decrease of fertility was generally considered as a natural reaction of the still greater decrease of mortality. Births were of interest only in relation to deaths, and the author himself recommended the computation of the actual total fertility only for cases where in the absence of life tables an accurate calculation of the net reproduction of the population was impossible. In the meantime, however, conditions have utterly changed. Fertility has decreased much more than mortality. No one still believes that anywhere

^a The total of the confinement rates is 4,047.4. This figure had to be raised to 4,134, since there were 1,014.7 births per 1,000 confinements.

in Western or Northern Europe the number of births is materially influenced by the number of deaths. Fertility has become a problem of itself. The accurate measurement of fertility, therefore, is most urgent.

10 In the report submitted to the Fourteenth Congress on Hygiene and Demography, it had been shown that according to the fertility of 1891–1900 in Sweden, 1,000 women entering child-bearing age would give birth to 4,134 children (including still-born), if none of these women died before having passed through child-bearing age. This also means, that each 1,000 girls born would give birth to 4,134 children, if none of those girls died before having passed through child-bearing age. And, since our purpose is here to exclude the influence of mortality, we may put it still more simply by saying that according to the fertility of 1891–1900 in Sweden, 4,134 is the number of children born to each 1,000 women.

The majority of those 4,134 children are boys. Since we are concerned here with births, we may restrict ourselves to the female sex. We should, moreover, since the live-births offer a better basis of comparison, exclude still-births. The total number of births in 1891–1900 was 1,374,118 of which 1,338,726 were live-births and 650,732 female live-births. The total fertility has therefore to be reduced in the proportion of 650,732:1,374,118. The new total thus obtained is $\frac{4134 \times 650,732}{1,374,118} = 1,957.8$ and this, according to the fertility of 1891–1900 in Sweden, is the number of girls born to each 1,000 women. $\frac{1957.8}{1000}$ or

1.958 would then be what we may call the gross reproduction rate of Sweden in 1891-1900.

The cases are, however, rare, where confinements or births are published by years of age of the mother, those data, as a rule, being made available for quinquennial age groups only. The question then arises whether an adequate gross reproduction rate may be computed from quinquennial fertility rates. If the number of women at each year within the quinquennial age group were the same, or if the annual fertility rates were all alike within the quinquennial period, all that would be necessary would be to multiply each quinquennial rate by five and add the products. But the number of women at each year of age and the fertility rates, of course, vary a great deal. Fortunately, however, those differences compensate each other to such a degree that they do not materially affect the final results.

Sweden may serve as an example for testing the accuracy of gross reproduction rates computed from quinquennial fertility rates.

The sum of the annual confinement rates was 4,074.4 for 1891–1900, and 3,832.3 for 1901–10.4 The sum of the quinquennial confinement rates, multiplied by five, was 4,070.0 for 1891–1900 and 3,826.3 for 1901–10. The total then was

*From 1891-1900 to 1901-10, the birth rate has decreased in Sweden from 27.14 to 25.77, the general fertility rate from 113 3 to 106.5, the total of the yearly confinement rates from 4,074 4 to 3,832.3. Since there were in the yearly average of 1901-10 138,224.4 confinements resulting in 140,319 3 births of which 136,840 8 were live-births and 66,446.1 female live-births, the total of the confinement rates has to be reduced in the proportion of 66,446.1:138,224.4. The gross reproduction rate then was 1.842.

seems safe to compute reproduction rates from quinquennial fertility rates.

The question naturally arises whether one might not go a step farther and compute reproduction rates from the general fertility rate. If the number of women in each quinquennial period from 15–20 to 45–50 years of age were the same or if the quinquennial fertility rates were all alike within the child-bearing age, all that would be necessary in order to find the total fertility would be to multiply the general fertility rate by 35 just as we have multiplied the seven quinquennial fertility rates by five. But the number of women at each quinquennial period of age and the quinquennial fertility rates, of course, vary a great deal. Let us again see how far in the case of Sweden those differences affect the results.

The sum of the annual confinement rates was 4,074.4 for 1891–1900 and 3,832.3 for 1901–10. The sum of the quinquennial confinement rates, multiplied by five, was 4,070.0 for 1891–1900 and 3,826.3 for 1901–10. The general confinement rate (from 15 to 50 years) was 114.58 for 1891–1900 and 107.57 for 1901–10. Multiplied by 35, those confinement rates would give a total of 4,010.4 for 1891–1900 and of 3,765.0 for 1901–10. The results would be by 1.5 and 1.6 per cent lower than those obtained from the quinquennial rates.

The differences just ascertained do not seem discouragingly high in themselves. Yet they are important enough to make a closer investigation necessary. The following table shows the gross reproduction rates in Sweden from 1776–1922, (a) computed

⁸ Louis I Dublin and Alfred J. Lotka have applied this abbreviated method in their study "On the True Rate of Natural Increase," Journal of the American Statistical Association, September, 1925, Vol. XX, p. 309.

from the quinquennial fertility rates, (b) computed from the general fertility rates:

YEARS	(a)	(b)	Years	(a)	(b)
1776-80 1781-85 1786-90 1791-95 1796-1800 1801-05 1806-10 1811-15 1816-20 1821-25 • 1826-30 1831-35 1836-40 1841-45 1846-50	2223.5 2009.2 2004.8 2150.5 2127.9 2066.1 11986.6 2108.3 2149.4 2333.6 2248.4 2231.2 2137.7 2153.4 2051.5	2223 8 2057.5 2075.4 2198.9 2127.8 2055.1 1977.4 2113.5 2180.4 2390.8 2214.9 2053.0 2066.9 2031.7	1851–55 1856–60 1861–65 1866–70 1871–75 1876–80 1881–85 1886–90 1891–95 1896–1900 1901–05 1906–10 1911–15 1916–20 1921–22	2045.2 2172.3 2195.1 2017.9 2147.2 2163.4 2080.7 2048.9 1967.5 1943.7 1881.3 1798.6 1593.7 1414.5 1346.0	2087.1 2219.1 2206.2 1992.8 2078.2 2070.4 2009.6 2031.3 1948.2 1906.8 1839.8 1781.1 1613.4 1446.9 1382.3

GROSS REPRODUCTION RATES IN SWEDEN, 1776-1922

The rates were almost identical in 1776-80 and 1796-1800. Those computed from the general fertility rates were higher in 1781-95, 1811-30, 1851-65, and 1911-22; in all the other periods they were lower than the rates computed from the quinquennial age groups. For some periods the differences are rather large: in 1786-90, rate (b) was by 3.5 per cent higher than rate (a); in 1836-45 and 1871-85, rate (b) was by 3.2 to 4.3 per cent lower than rate (a). In 1786-90 and 1876-80, rate (a) was 2,004.8 and 2,163.4, while rate (b) was 2,075.4 and 2,070.4; that is, the more accurate rate (a) increased by 8 per cent, while rate (b) showed a slight decrease.⁷ A com-

⁷ The still less accurate birth rate showed a considerable decrease, from 32.1 to 30.3.

parison of the basic data for 1786-90 and 1876-80 will throw some more light upon the causes of this discrepancy.

	15-20	20-25	25-30	30-35	35-40	40-45	45-50	TOTAL
Women 1786-90 1876-80	94,956 222,504	95,012 190,398	91,353 164,100	86,998 148,737	79,696 140,030	68,371 134,100	59,500 124,108	575,886 1,123,977
Confinements 1786-90 1876-80	9,882 11,111	54,752 101,785	91,509 172,231	93,931 173,694	65,742 143,320	31,470 78,825	6,127 11,818	353,413 692,784
Confinement Rates 1786-90 1876-80	20 81 9 99	115 25 106.92	200 34 209 91	215 94 233.56	164 98 204.70	92.06 117.56	20.59 19.04	122 74 123.27

It appears that the age groups from 15 to 25 years and from 40 to 50 years which are the least fertile were much more strongly represented in 1876–80 than in 1786–90, while the contrary is true of the age groups from 25 to 40 years. Let us see what would have been the general confinement rate in 1876–80, if the age composition would then have been the same as in 1786–90. The number of confinements would have amounted to 742,531 (instead of 692,784), and the general confinement rate to 132.13 (instead of 123.27). Let us see, on the other hand, what would have been the general confinement rate in 1876–80, if the age composition had been what it was, but if the quinquennial confinement rates had been the same as in 1786–90. The number of confinements would have amounted to 647,853 only, and the general confinement rate to 115.28.

The deviation of the trend of the general fertility rates from the trend of the quinquennial fertility rates will perhaps still better be illustrated on the basis of an hypothetical case. Assuming that the number of women and of births is as indicated in the following table, the total of the quinquennial fertility rates multiplied by 5 would be 5,550, and the general fertility rate multiplied by 35 would likewise be 5,550.

	15 TO 20 YEARS	20 TO 25 YEARS	25 TO 30 YEARS	30 to 35 Years	35 TO 40 Years	40 to 45 Years	45 to 50 Years	TOTAL
Women Births Fertility Rate	100,000 2,000 20	90,000 13,500 150	80,000 20,000 250	70,000 21,000 300	60,000 13,200 220	50,000 6,000 120	40,000 2,000 50	490,000 77,700 1,110

Let us now assume that there were 10,000 more women of 15 to 20 years and 10,000 less women of 45 to 50 years, while the number of births remained the same for each age group. The general fertility rate, of course, would remain the same. but the fertility rate in the age group from 15 to 20 years would drop from 20 to 18.18, while the fertility rate of the age group from 45 to 50 years would rise from 50 to 66.67, and the total of the quinquennial fertility rates multiplied by 5 would increase from 5.550 to 5.624. Let us assume on the other hand that the number of women in each age group remained the same, but that there were 1,000 more births in the youngest age group and 1,000 less births in the oldest age group. The general fertility rate would then still remain the same, but the fertility rate in the youngest age group would increase from 20 to 30, the fertility rate in the oldest age group would drop from 50 to 25, and the total of the quinquennial fertility rates would be 5,475 instead of 5,550. The trend of the general fertility rates indeed follows so little the trend of the quinquennial fertility rates that it is not justifiable to compute a gross reproduction rate from a general fertility rate.

The table on pages 37–39 shows for those countries for which they could be computed (1) fertility rates by quinquennial age groups;⁸ (2) the total fertility, that is the sum of the quinquennial fertility rates multiplied by five, which indicates the number of children⁹ born to 1,000 women; (3) the gross reproduction rate, that is the number of live-born girls born to each woman. The table on page 33 summarizes the gross reproduction rates for the last sixty years.

In analyzing the trend of the gross reproduction rate in the various countries, we shall begin with Northern Europe, since the data available for Western Europe are less comprehensive.

Finland. In 1866–70, the gross reproduction rate (on account of the famine of 1867–68) was comparatively low; it amounted to 2.084 only. Between 1871–75 and 1886–90 it fluctuated between 2.363 and 2.420. In 1891–1900, it dropped to 2.278 and then fell from period to period until in 1921–25 it was 1.533 only. Since the birth rate in 1926 was 21.70 as compared with 23.22 in 1921–25, the gross reproduction rate in 1926 was presumably about 1.43.

⁸ The reader will perhaps wonder why the decrease of fertility is comparatively small for women under 25 years and particularly large for women over 30 years. We have, however, two good reasons for not telling why this is the case: first, we do not know it; second, this would lead us into a discussion of the causes of decreasing fertility which lies outside the scope of this study. We may mention in this connection that an analysis of the causes of decreasing fertility would presuppose a thorough study of the marital conditions in the different age groups, a distinction between first and later children born to mothers of the different age groups, etc.

⁹ The figures refer, as the case may be, to live-born children, live- and still-born children, or confinements.

							
YEARS	FINLAND	Norway	DENMARK	Sweden	France	GERMANY	England And Wales
1866-1870 1871-1875 1876-1880 1881-1885 1886-1890 1891-1895 1896-1897 1898-1900 1901-1903 1904-1905 1906-1907 1908-1910 1911-1913 1914-1915 1916-1919 1920 1921 1922 1923 1924 1925 1926	2.084 2.388 2.420 2 363 2.400 } 2.278 } 2.140 } 1.716 } 1.533 (1.43)	\ \} 2.275 \\ \} 2.144 \\ \} 2.064 \\ \} 1.853 \\ \} 1.661 \\ (1.33)	2.220b 2.140d 2.042f 1.954 1.851 1.671 1.523 1.391 1.270	2.018 2.147 2.163 2.081 2.049 1.968 1.944 1 1.881 1.799 1 1.594 1.414 1.346	1.393 1.310 1.232 0.766 1.282 1.159 (1.15)	(2.459) (2.366) (2.126) (1.132) (1.07)	1.312 (1.079) (1.05)
• 1874–1876 • 1892–1897		b 1878–1: / 1895–1:		• 1889 • 1899	-1892 -1905	_	885-1894 910-1911

GROSS REPRODUCTION RATES, 1866-1926

Norway. The gross reproduction rate dropped from 2.275 in 1874-76 to 1.661 in 1916-20. Since the birth rate in 1926 was 19.67 as compared with 24.54 in 1916-20, the gross reproduction rate in 1926 was presumably about 1.33.10

Denmark. The gross reproduction rate declined steadily from 2.220 in 1878-84 to 1.270 in 1926.11

¹⁰ Since the birth rate in 1927 fell to 18.83, the gross reproduction rate in that year was presumably about 1.27.

¹¹ Since in 1927 the birth rate dropped to 19.6, the gross reproduction rate in that year was about 1.22.

Sweden. Between 1776-80 and 1886-90 the gross reproduction rate fluctuated between 1.987 (1806-10) and 2.334 (1821-25). In 1891-95, it dropped to 1.968 and then fell from period to period until in 1921-22 it was 1.346 only. Since the birth rate in 1926 was 16.88 as compared with 20.56 in 1921-22, the gross reproduction rate in 1926 was presumably about 1.11.

France. The gross reproduction rate, as far back as 1892-97, was 1.447 only, that is about as low as the rate in Finland in 1926. But it further dropped from period to period until in 1908-13 it was 1.232. During the war it was, of course, exceedingly low; in the 77 unoccupied provinces it amounted to 0.766 only. In 1920-21. it rose to 1.282, but it fell again and in 1922-25 was 1.159. Since the birth rate in 1926 was 18.78 as compared with 19.00 in 1922-25, the gross reproduction rate in 1926 was about 1.15.12

Germany. The gross reproduction rate dropped from 2.459 in 1881-90 to 2.366 in 1891-1900 and to 2.126 in 1901-10. In 1925, it was 1.132 only. Since the birth rate in 1926 was 19.54 as compared with 20.73 in 1925, the gross reproduction rate in 1926 was about 1.07.13

England and Wales. The gross reproduction rate dropped from 1.312 in 1921 to 1.079 in 1925. Since the birth rate in 1926 was 17.78 as compared with 18.27 in 1925, the gross reproduction rate in 1926 was about 1.05.14

¹² Since in 1927 the birth rate dropped to 18.11, the gross reproduction rate in that year was about 1.10.

13 Since in 1927 the birth rate dropped to 18.3, the gross reproduction rate

in that year was about 1.00.

¹⁴ Since in 1927 the birth rate dropped to 16.7, the gross reproduction rate in that year was about 0.98.

The following table shows the gross reproduction rate and the birth rate for 1926.

GROSS REPRODUCTION RATE AND BIRTH RATE, 1926

Countries								Gross Repro- duction Rate	BIRTH RATE		
Finland .				٠,		•	,			1.43	21.7
Norway .									.	1.33	19.7
Denmark									٠, ا	1.27	20.5
Sweden .									.	1.11	16.9
France .							i			1.15	18.8
Germany				Ċ	Ċ	-	Ċ	Ċ		1.07	19.5
England .	÷		:	:	:	÷		Ċ	. 1	1.05	17.8

France and Sweden have about the same gross reproduction rate, but their birth rate is 18.8 and 16.9 respectively. Germany and Norway have about the same birth rate, but their gross reproduction rate is 1.07 and 1.33 respectively. The relation of the birth rate to the gross reproduction rate, then, differs so widely that it would be quite impossible to make use of the birth rate for estimating the gross reproduction rate.

Nor is there a close relation between the general fertility rate and the gross reproduction rate. This has already been shown for Sweden. The ratio of the two rates is given here for all countries for the last period for which fairly accurate data are available.

In Finland and Norway the gross reproduction rate is 17.1 times as large as the general fertility rate; in Germany, on the other hand, it is only 15.8 times as large. The differences are then rather important. They are, however, not so large as to forbid a rough estimate of the gross reproduction rate in all Western and Northern Europe.

The general fertility rate in that territory in 1926 has been shown to be 68.5 per 1,000.15 If, in order to give appropriate weighting to the respective ratios, we multiply this general fertility rate by 16.3 or 16.4, we arrive at a gross reproduction rate of 1.12.

GROSS REPRODUCTION RATE AND GENERAL FERTILITY RATE

COUNTRIES	Years	Gross Refro- duction Rapi:	GENERAL FERTILITY RATE	RATIO OF GROSS RE- PRODUCTION RATE TO GENERAL FERTILITY RATE
Finland	1921–25	1.533	89.6	17.1
	1916–20	1.661	97.3	17.1
	1926	1.270	78.6	16.2
	1921–22	1.346	81.1	16.6
	1922–25	1.159	69.5	16.7
	1925	1.132	71.4	15.8
	1921	1.312	79.2	16.6

In the eighties of the last century, the gross reproduction rate in Germany and in Northern Europe varied between 2.0 and 2.5. The total number of children (boys and girls) born to each woman then averaged four or five. Conditions were more or less the same in the other countries of Western Europe with the exception of France and Ireland, where the number of children to each woman probably was about three. In 1926 the gross reproduction rate in the large countries of Western Europe as well as in all countries of Northern Europe varied between 1.05 and 1.43. The total number of children (boys and girls) born to each woman then varied between 2.15 and 2.95. Con-

ditions were more or less the same in the smaller countries of Western Europe with the exception perhaps of Holland, where the number of children to each woman possibly still exceeded three.

According to the fertility in Western and Northern Europe in 1926, the number of girls born to each woman is 1.12, and the number of children (boys and girls) born to each woman 2.3.

FERTILITY RATES BY QUINQUENNIAL AGE GROUPS, 1776-1926

Yuars	15 TO 20 YEARS	20 TO 25 YEARS	25 TO 30 Years	30 TO 35 Years	35 TO 40 YEARS	40 TO 45 YEARS	45 TO 50 Years	TOTAL FERTIL- ITY	GROSS REPRO- DUCTION RATE
DENMARK									
			((Confineme	nt rates)				
1878-84 1885-04 1895-1900 1901-05 1906-10 1911-15 1918-20 1921-25 1926	14.1 15.5 17.3 20.1 24.5 23.0 22.1 24.0 23.6	132.5 132.6 140.3 148.1 148.4 137.6 128.6 122.0 114.9	239.7 233.7 224.1 225.3 208.2 187.8 173.5 160.8 145.1	244.5 224.8 200.0 198.1 182.6 161.4 148.1 131.5 122.6	190.3 183.4 170.0 150.0 135.5 119.6 100.5 03.3 7.96	95.0 90.0 78.9 66.9 60.8 54.2 47.8 41.0	10.7 9.2 8.2 7.3 5.9 5.5 4.0 4.1 3.3	4,683.4 4,446.1 4,238.9 4,054.2 3,829.5 3,450.1 3,150.1 2,833.4 2,625.0	2.220 2.140 2.042 1.954 1.851 1.671 1.523 1.391 1,270
				ENGL	AND				
			1	(Live-birtl	n rates)				
1921	15.3	108.0	156.1	137.5	[96.9	22.0	2.3	2,690.6	1.312
				FINLA	ND				
			((Confineme	nt rates)				
1866-70 1871-75 1876-80 1881-85 1886-90 1891-1900 1901-10 1911-20 1921-25	13 8 18.7 20.2 20,0 18.3 17.3 16.2 14,6	123.9 149.0 153.6 151.7 155.7 154.8 138.5 116.7 115.8	215.8 230.0 238.6 231.3 236.8 211.4 211.0 167.7 161.1	220 7 252.9 244.0 238.6 240.5 237.8 216 0 165.6 138.9	177.6 202.6 209.5 209.5 204.4 192.7 184.9 142.3 119.9	99.1 111.4 119.5 121.3 121.2 115.6 106.0 86.0 68.8	18.0 10.8 19.3 19.3 20.7 17.7 16.0 13.1 10.7	4,343.6 4,971.8 5,023.3 4,914.2 4,988.1 4,740 4,447.6 3,579.9 3,198.6	2.084 2.388 2.420 2.363 2.400 2.278 2.140 1.716 1.533

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FERTILITY RATES by QUINQUENNIAL AGE GROUPS, 1776-1926 (Continued)

Years	15 TO 20 Years	20 TO 25 YEARS	25 TO 30 YEARS	30 TO 35 YEARS	35 TO 40 Years	10 TO 45 YEARS	45 TO 50 YEARS	Total Fertil- ify	TOTAL REPRO- DUCTION RATE
	i		1						

FRANCE

(Live- and still-birth rates)

1892-97	28.5	1 131.8 1	179.4	141.8	92.3	39.1	6.7	3.099.0 1	1.447
1898-1903	27 B	141.2	160.9	128.6	86.8	35.7	5.7	2.978 4	1 393
1904-07	28.3	138.1	158.2	121.7	76.0	32.7	5.1	2.801.1	1,310
1908-13	28.4	130.3	150.1	109.1	708	27.2	27	2,638.1	1,232
1914-19a	15.0	73.7	88.5	72.8	53.3	23.3	2.3	1.644.7	.706
1920-21	24.6	137.5	166.1	118.3	72.5	27.8	2.7	2,747.4	1 282
1922-25	25.3	133.4	146.1	103.5	60.2	22.0	2.3	2,468.6	1.159

a 77 provinces only (excluding 10 occupied provinces).

NINE GERMAN STATES

(Live- and still-birth rates)

1881-90		177.2				80,2	10.2	4,922.3 4,773.8	_
1891-1900	20.7	182.7			166 5	69.7 59.0	8.2	4,773.8	_
1901-10	23.3	176.0	260.8	198.5	138.1	l 59.0	6.4	4,310.1	

Live- and still-births in Hesse, Oldenburg, Brunswick, Saxony-Weimar, Saxony-Altenburg, and the Schwarzburg and Rauss principalities.

SAXONY

(Live- and still-birth rates)

1911-14	28.7	159.9	182.2	125.1	89.9	37.9	3.1	3,134.1	1.472
1915-19 1920-23	10.1 18.3	71.8 124.5	$08.5 \\ 149.5$	73.4 108.0	53.3 63.0	21.6	2.0 1.9	1,653.5 2,443.4	.772 1,141
1924	17.8	102.0	113.7	79.6	45.6	16.5	1.4	1.883.1	879

NORWAY

(Live-birth rates)

1874-76 1889-92°	1	7.2 7.5	-	101.3	-	208 9 203 6		238.6 230.0		212.3 209.7	134.8 129.1	ļ	31.1 29.8	1	4,671.2 4.547.4		2,275 2,144
1899-1905 1910-11		11.2 10.5	1	109.8 103.9		203.7 184.5		210.8 187.8		182.1 164.7	110.1 92.5		21.7 18.0		4,246 9 3,809,5		2.064 1.853
1916-20	1	11,0	ļ	103.0	1	187.6	İ	170.8	l	141.5	79.4	ı	14.1	ļ	3,437.2	ı	1.661

a Live- and still-birth rates.

FERTILITY RATES BY QUINQUENNIAL AGE GROUPS, 1776-1926 (Continued)

YEARS	15 TO 20 YEARS	20 TO 25 YEARS	25 TO 30 YEARS	30 TO 35 YEARS	35 TO 40 Years	40 TO 45 YEARS	45 TO 50 YEARS	TOTAL FERTIL- ITY	Gross Repro- duction Rate						
	SWEDEN														
	(Confinement rates)														
$\begin{array}{c} 1776-80 \\ 1781-85 \\ 1786-90 \\ 1791-95 \\ 1796-105 \\ 1801-05 \\ 1801-05 \\ 1801-105 \\ 1801-105 \\ 1810-105 \\ 1810-105 \\ 1810-205 \\ 1826-205 \\$	20.6 21.3 20.8 20.0 19.1 17.2 15.2 16.6 16.0 12.2 8.8 7.4 7.4 8.0 8.0 10.3 10.3 10.3 11.6 11.6 11.6 11.6 11.6 11.6 11.6 11	110,6 114,9 115,3 125,0 121,5 117,1 111,6 120,2 130,8 127,1 120,7 107,4 94,3 101,4 94,3 101,8 104,5 105,9 10	214.4 201.1 200.3 218.0 214.7 206.4 202.2 211.5 225.0 226.9 213.9 200.1 204.6 209.1 209.9 201.4 198.6 198.3 186.3 148.7 142.7	242.9 212.1 215.9 234.3 234.1 222.8 213.7 228.2 242.5 230.4 242.5 230.8 242.5 230.8 239.8 239.8 225.1 238.0 239.8 249.1 238.0 249.1	190.7 170.2 165.0 175.7 180.4 175.7 180.4 197.6 198.7 197.6 198.7 197.3 201.1 198.7 195.2 208.3 203.1 195.2	106.2 88.5 92.1 96.4 92.4 90.0 102.9 107.2 109.6 107.2 110.6 110.1 120.7 127.0 113.8 108.0 102.7 96.9 87.8 96.9 87.8 96.9 58.7 52.6	26.0 20.5 20.6 21.4 20.5 19.5 19.5 18.5 19.4 19.3 18.3 18.0 17.7 17.6 16.8 18.1 19.1 19.1 19.1 19.1 19.1 19.1 19	4,602 4,143 4,154 4,454 4,414 4,265 4,097 4,343 4,281 4,444 4,651 4,651 4,661 4,473 4,272 4,528 4,528 4,528 4,528 4,528 4,528 4,528 4,528 4,528 4,528 4,528 4,528 4,538 4,548 4,648	2.224 2.009 2.005 2.150 2.128 2.086 2.108 2.108 2.108 2.149 2.334 2.248 2.248 2.248 2.245 2.172 2.172 2.172 2.183 2.045 2.172 2.183 2.045 2.183 2.045 2.183 2.081 2.081 2.081 2.081 2.081 2.084 2.199						

CHAPTER III

NET REPRODUCTION RATES

WE have thus far only discussed how much the population increases through births, but we have not yet examined how much it decreases through deaths. In this chapter we will study the balance of birth and deaths.

The usual method of establishing such a balance consists in comparing the number of births and the number of deaths. It will be pointed out, for example, that from 1841 to 1880 there was in Western and Northern Europe a yearly number of births of 3,842,000 and a yearly number of deaths of 2,869,000, leaving a yearly balance of 973,000 or 0.81 per cent of the population; that from 1881 to 1914 the yearly number of births was 4,497,000 and the yearly number of deaths 3,027,000, leaving a yearly balance of 1,470,000 or 0.93 per cent of the population; that finally. in 1926, there were 3,613,000 births and 2,449,000 deaths. leaving a balance of 1,164,000 or 0.62 per cent of the population. It will then, as a rule, be concluded that the natural increase of the population of Western and Northern Europe, while being relatively smaller than before the World War, is still very strong, since an annual increase of 0.62 per cent means a doubling of the population within about 110 years.

As a matter of fact, births even in Western and Northern Europe still amply keep up with deaths. But this does not imply that the reproduction of the people of Western and Northern Europe is still ample. If the nowly born were merely to replace the dead, all that would be necessary would be that births equal deaths and if no death occurred, no birth would be needed. This consideration in itself shows that something must be wrong with the usual comparison of births and deaths. If in a given population no death occurred and no birth, this population would ever grow older and after fifty years there would be no more women of child-bearing age and no more men with full physical working capacity. The total population would still be as large as fifty years earlier, but in those fifty years it would not have done anything towards its reproduction and it would have lost any future chance of reproduction.

A comparison of the yearly births and the yearly deaths is not sufficient to allow a judgment upon vitality. If in a given country the number of aged persons is small and the number of persons in the best years of life is large, this country may have a low death rate and a high birth rate even if mortality in each age group is large and if fertility is small. The possibly large excess of births over deaths in such a country may give the impression of a still high vitality while the fertility in fact is perhaps no longer sufficient to enable this population to hold its own. In spite of the still large excess of births over deaths, mortality and fertility may already be such that if they do not change, this population is doomed to die out.

The pertinent question is not: is there an excess of births over deaths? but rather: are natality and mortality such that a generation which would be permanently subject to them would during its lifetime, that is until it has died out,

produce sufficient children to replace that generation? If, for instance, 1,000 newly born produce in the course of their lives exactly 1,000 children, the population after the death of the older 1,000 will remain unaltered. If natality and mortality continue to be what they were, the 1,000 children will in the course of their lives again produce 1,000 children, and if natality and mortality remain permanently the same, the population will always exactly hold its own. If more than 1,000 children are produced by a generation of 1,000 newly born, the population will increase; if less than 1,000 are produced, the population will decrease and finally die out.

Since we are concerned here with birth-giving only, it suffices to take into account the female population. The pertinent question then is: are natality and mortality such that 1,000 newly born girls will in the course of their lives give birth to 1,000 girls? If this is the case, the first generation of 1,000 females will at its death have been fully replaced by the girls they have borne, and the population will remain constant; otherwise, it will in the long run increase or decrease.

It becomes necessary, first, to ascertain on the basis of present mortality how many out of 1,000 newly born girls reach child-bearing age, that is, 15 years, how many reach 16 years, etc., finally how many pass through child-bearing age, that is, reach fifty years. This information is to be derived from the life table which for

¹ See, for a full description of life tables, *United States Life Tables 1890*, 1901, 1910, and 1901-1910, prepared by James W Glover, Washington, 1921.

a given period exhibits the number of feriales surviving at the beginning of each year of age out of 1,000 live-born, assuming that the mortality for each year of age was that of the period under consideration.

It becomes necessary, secondly, to ascertain the actual number of females living in each year of child-bearing age and the number of female births by years of age of the mother in order to compute the female fertility rate for each year of age, that is, the number of female births for 1,000 women of 15 to 16 years, for 1,000 women of 16 to 17 years, etc.

It becomes necessary, thirdly, to apply those fertility rates to the number of women who according to the life table would in a stationary population be 15 to 16 years of age, 16 to 17 years, etc. These numbers are derived from the numbers of female survivors by assuming that the women of 15 to 16 years would be equal to the average of those surviving 15 and those surviving 16 years, etc. By multiplying the number of women of 15 to 16 years in the stationary population by the female fertility rate of the women of 15 to 16 years, we find how many girls will be born to 1,000 newly born girls at the age of 15-16 years (with present natality and mortality). By a similar computation we find the results for the age of 16-17 years, etc. The sum of all the new fertility rates thus found will show the total number of females borne by the original stock of 1,000 females. If this total is equal to 1,000, the population holds its own; if it is larger, the population increases; if it is smaller, the population, in

case natality and mortality continue the same, is bound to die out.

This is the only accurate method of calculating a fertility table. The basic data needed for its computation are a life table for females, the actual number of women for each year of child-bearing age, and the number of female live-born by years of age of the mothers.2 The table on page 45 shows the results for Sweden in 1891-1900 and 1901-10.3

² Since the female live-born are practically never classified by years of age of the mothers, one may, as the case may be, substitute the total liveborn or the total live- and still-born or the confinements and reduce the sum of the fertility rates according to the ratio which the total live-born or the total live- and still-born or the confinements bear to the number of female live-born.

^aThe first fertility table was calculated in 1886 by Richard Boeckh, director of the statistical office of the city of Berlin. (See Statistischer Jahrbuch der Stadt Berlin 1884, pp. 30-34.) He took the life table of the city of Berlin for 1879, multiplied the number of females of each year of age by the fertility rate of that year of age in 1879 and added the products so obtained. The sum, 2,172, gave him the number of births to 1,000 females on the basis of the natality and mortality of 1879. Since according to the distribution of the sexes at birth there were 2,053 births per 1,000 female births. he concluded that the real natural increase of the Berlin population in 1879

was $\frac{2,172}{2,053} - 1 = 6$ per cent. He later calculated five similar fertility tables for 1886-90. The author of this book, who in 1898-1900 was a student of Boeckh and an assistant in the Berlin statistical office, computed five such tables for 1891-95, while the successor of Boeckh, E. Hirschberg. computed five tables for 1896-1900. (See Statistisches Jahrbuch der Stadt Berlin 1893, p. 36, 1897, p 57, 1899, pp 101-104, 1900-02, pp 82-83.) These Berlin tables for 1879 and 1886-1900 and a Swedish table for 1891-1900 which the author computed in 1907 in connection with his address to the Fourteenth Congress on Hygiene and Demography, seem to be the only complete fertility tables that so far have been calculated.

FERTILITY TABLES OF SWEDEN, 1891-1900 AND 1901-10

Years of	CONFINEM 1,000 F	ENTS PER EMALES	Years Live Live-Born	D BY 1,000 FLMALES	Confinemen Live-Born	IS PER 1000 FEMALES
Ace	1891-1900	1901–10	1891-1900	1901–10	1891–1900	1903-10
12		0.00 0.02 0.11 0 67 3.33 11.23 26.32 48.28 73.66 100.26 125.09 146.24 163.76 176.66 187.13 191.69 196.84 196.33 193.39 193.39 196.84 196.33 193.39 193.39 194.69 183.36 179.08 179.08 146.68 120.46 146.68 146.68 146.68 146.68 146.69 146.09 85.40 64.00 64	816.78 813.76 810.66 807.35 803.76 800.11 796.28 792.17 787.95 783.69 779.30 765.37 760.69 756.08 751.52 746.86 742.11 737.35 732.54 727.74 718.00 712.95 707.97 702.91 697.65 692.33 686.97 681.60 676.24 670.82 665.34 670.82 665.34 670.82 665.34 670.82 665.34 670.82 665.34 670.82 665.34 670.82 67	858.29 855.38 852.23 848.82 845.09 841.09 836.95 832.75 828.46 823.98 819.38 819.38 810.21 805.50 800.65 795.84 791.10 786.37 7781.60 776.88 772.23 767.55 762.75 757.84 772.21 716.97 7711.68 700.84 689.32 683.34 677.17 670.85		0.00 0.02 0.09 0.57 2.81 9.45 22.03 40.21 61.02 82.61 102.50 119.15 132.68 142.30 149.83 152.55 154.79 153.45 154.79 153.45 154.79 153.45 154.75 116.87 108.96 98.20 98.20 98.20 109.20
TOTAL .	4,074.42	3,832.30			2,987.11	2,973.34

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According to this table, the number of confinements per 1,000 live-born girls was 2,987.1 in 1891-1900. Since the 1,354,225 confinements which occurred in that period yielded 650,732 live-born girls,4 the original stock of 1,000 live-born girls yielded $\frac{2,987 \times 650,732}{1.354,225} = 1,435$ girls. The actual number of births then was 43.5 per cent higher than was necessary to maintain the population and the net reproduction rate, as we may call it, was 1.435. Since the gross reproduction rate was 1.9585 we come to the following conclusion: According to the fertility prevailing in Sweden in 1891-1900, 1,958 girls were born to each 1,000 women; according to the mortality prevailing in the same period, this number would be reduced to 1.435. If fertility and mortality had remained the same, the 1,435 surviving girls would give birth to $1,435 \times 1.958$ girls of whom $\frac{1,435}{1.958}$ would survive, so that the net yield of the 1,435 girls would be $1.435 \times 1.435 = 2.060$, etc. Population would double in about two generations.

But fertility and mortality, of course, change. In Sweden, the gross reproduction rate dropped from 1.958 in 1891–1900 to 1.842 in 1901–1910, and mortality decreased almost as much. As a result of this the number of confinements per 1,000 live-born girls fell only from 2,987 to 2,973 and the net reproduction rate from 1.435 to 1.429.

Since confinements or births are, as a rule, made available for quinquennial periods only, the question arises whether an adequate net reproduction rate may be computed from quinquennial fertility rates. Such computations indeed were made fifteen years ago by a student of Boeckh, Johannes Rahts, who at that time was chief of the population division of the German Statistical Office. Thirty-two abbreviated fertility tables of the same kind are given in Appendix D. Let us test again in the case of Sweden how far the results of the abbreviated method differ from those of the accurate method.

As shown in the table on page 45, the number of confinements per 1,000 live-born girls was 2,987.1 in 1891–1900 and 2,973.3 in 1901–10. If one substitutes the figures of quinquennial age groups, the number of confinements appears to be 2,982.5 and 2,967.8. The net reproduction rate according to the accurate method was 1.4354 in 1891–1900 and 1.4293 in 1901–1910, according to the abbreviated method it was 1.4331 and 1.4266, respectively. These differences are so small that it seems safe to compute net reproduction rates from quinquennial age groups.

It may again be asked whether one might not go a step farther and compute net reproduction rates from general fertility rates. The general confinement rate (from 15 to 50 years) in Sweden was 114.58 for 1891–1900 and 107.57 for 1901–1910. Multiplied by the number of years lived (25.56 in 1891–1900 and 26.97 in 1901–1910), those confinement rates would give a total of 2,928.5 and 2,900.9. The results would be by 1.8 and 2.3 per cent lower than those obtained from quinquennial rates. These differences perhaps do not appear so very large in themselves. But they are actually much more serious in other cases. For

⁶ Rahts has computed such abbreviated fertility tables for a group of German states in 1881–90, 1891–1900, 1901–10, for Sweden in 1816–40, 1841–55, 1891–1900, for Denmark in 1895–1900, and for France in 1898–1903. (See Statistik des Deutschen Reichs, Vol. 246, pp. 18*–19*.) In recent years a similar table has been computed by Dublin and Lotka for the white population of the United States in 1920. (See Journal of the American Statistical Association, September, 1925, Vol. XX, p. 309.)

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1871-80, for instance, the general confinement rate (123.68) multiplied by the number of years lived (23.57) would give a total of 2,915.6 or 3.9 per cent less than that obtained from the quinquennial rates.⁷ The general fertility rates, then, can be used no more for computing net reproduction rates than for computing gross reproduction rates.

L. The net reproduction rate, of course, must always be smaller than the gross reproduction rate Both rates could only be equal, if all newly born girls reached child-bearing age and passed through child-bearing age. The table on page 49 shows how many out of 1,000 newly born girls enter child-bearing age and how many live through the childbearing period. It will be seen, for instance, that in Denmark, according to the mortality of 1885-94, 758 out of 1,000 newly born girls entered child-bearing age and 583 passed through child-bearing age, while for 1926 the corresponding figures are 901 and 782. The last column of this table shows the average number of years lived in child-bearing age by the newly born girls. If none of them died before 50 years of age, they would all live 35 years in child-bearing age. The average number of years lived in child-bearing age must, therefore, always be lower than 35 years. It was lowest, according to this table, in Germany in 1881-90, when the average number of years lived in child-bearing age was 20.22 only. By 1925, this number had risen to 28.42. The average number for all Western and Northern Europe in 1926 was probably about 29.

⁷ Johannes Rahts, whom we asked for an opinion, emphasized the fact that the deviations are the larger the more the actual age distribution differs from that of a stationary population.

Women Passing through Child-Bearing Age, 1816-1926

	Ye/	\RS			- net		Temales S 15 Years Out or 1,000	50 Years	YEARS LIVED BETWEEN 15 AND 50 YEARS
							Denmark		
1885-94 . 1895-1900 1901-05 . 1906-10 . 1911-15 . 1916-20 . 1921-25 . 1926					:		758 802 839 856 871 872 897 901	583 644 684 710 730 703 773 782	23.70 25 60 26.97 27.72 28.38 27.79 29 62 29.84
					_	Engl	and and Wales	i	
1920-22 .						. 1	871	742	28.61
							Finland		
1881-90 . 1901-10 . 1911-20 . 1921-25 .	:	:	:	:			699 751 778 836	526 574 580 667	21 69 23.31 23.87 26.38
							France		
1898-1903 1908-13 . 1920-21 . 1922-25 .	:	:	•	•	:		772 816 837 866	584 636 665 699	23 98 25.71 26.50 27.64
							Germany		
1881-90 . 1891-1900 1901-10 . 1925	:	•	:	•	:		653 696 749 866	481 538 598 738	20 22 21.96 23.92 28.42
							Sweden		
1816-40 . 1841-50 . 1851-60 . 1861-70 . 1871-80 . 1881-90 . 1891-1900 . 1901-10 . 1911-15 . 1916-20 . 1921-22 .							719 741 716 727 749 778 809 851 878 876 904	513 554 527 558 580 614 640 680 713 680 756	22.08 23.13 22.20 22.88 23.57 24.63 25.56 26.97 28.04 27.23 29.29

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This shows that there is not much margin left for further improvement. It will probably never be possible to raise that number by another 10 per cent. We may succeed in materially extending the lives of the women who have passed child-bearing age, but this, of course, will not in the least affect the number of births. No essential change of the net reproduction rate should, therefore, be expected from a reduction of mortality.

The table on pages 50-51 shows for those countries for which net reproduction rates could be computed the gross reproduction rates, the net reproduction rates, and the ratio between the two rates.

GROSS REPRODUCTION RATES AND NET REPRODUCTION RATES, 1816-1926

	Y	ear:	s				Gross Rate	NLT RATE	RATIO (GROSS RATE = 100)				
							Denmark						
1878-84 . 1885-94 . 1895-1900 1901-05 . 1906-10 . 1911-15 . 1916-20 . 1921-25 .							2 220 2.140 2.042 1.954 1.851 1.671 1.523 1.391 1.270	1.463 1.509 1.524 1.486 1.372 1.228 1.192 1.097	68 74 78 80 82 81 86 86				
England and Wales													
1921 . : 1925 . :	•	:	:				1,312 1,079	1.087	83				

GROSS REPRODUCTION RATES AND NET REPRODUCTION RATES, 1816-1926 (Continued)

	Y	EAR	3	<u> </u>			Gross Rate	Net Rate	RATE (GROSL RATE = 100)
							Finland		
1866-70 . 1871-75 . 1876-80 . 1881-90 . 1891-1900 . 1901-10 . 1911-20 . 1921-25 .							2.084 2.388 2.420 2.380 2.278 2.140 1.716 1.533	1.485 1.433 1.161 1.146	62 67 68 75
							France		•
1892-97 . 1898-1903 1904-07 . 1908-13 . 1914-19 . 1920-21 . 1922-25 .	•		•	:			1.447 1.393 1.310 1.232 0.766 1.282 1.159	0.979 0.930 0.994 0.937	70 75 78 81
							Germany		
1881-90 . 1891-1900 1901-10 . 1925	•	•	:		•	:	2.459 2.366 2.126 1.132	1.448 1.512 1.480 0.937	59 64 70 83
							Sweden		
1816-40 . 1841-50 . 1851-60 . 1861-70 . 1871-80 . 1881-90 . 1891-1900 . 1901-10 . 1911-15 . 1916-20 . 1921-22 .							2.218 2.100 2.111 2.106 2.155 2.064 1.958 1.842 1.594 1.414 1.346	1,411 1,394 1,343 1,379 1,454 1,455 1,435 1,429 1,288 1,111 1,137	64 66 64 65 67 70 73 78 81 79

In studying the trend of the net reproduction rate, we shall again begin with Northern Europe where the available data are more complete.

Finland. The net reproduction rate which in 1881-90 and 1901-10 had been 1.485 and 1.433, respectively, dropped to 1.146 in 1921-25. Since the gross reproduction rate fell from 1.533 in 1921-25 to about 1.43 in 1926, the net reproduction rate in that year was certainly lower than in 1921-25; it presumably was about 1.09.

Denmark. The net reproduction rate rose from 1.463 in 1885-94 to 1.524 in 1901-05. It then decreased steadily to 1.097 in 1926.8

Sweden. While the gross reproduction rate began its fall in the nineties of the last century, the net reproduction rate as late as 1901–10 was rather high. It fluctuated altogether from 1816–40 to 1901–10 between 1.343 and 1.455. In 1911–15, it dropped to 1.288 and in 1916–20 to 1.111. In 1921–22, with strongly decreasing mortality, it rose to 1.137. Since the gross reproduction rate in 1926 was presumably 1.11, the net reproduction rate in that year was presumably about 0.95.

France. The net reproduction rate as far back as 1898–1903 was only 0.979. The gross reproduction rate continued to decrease faster than mortality so that in 1908–13 the net reproduction rate was 0.930. During the war, the net reproduction rate was below 0.6. In 1920–21, it rose to 0.994. The increase of fertility after the war did then not result in more than a balance of births and deaths. In

⁸ In 1927, it dropped to about 1.03.

1922-25, the net reproduction again dropped to 0.937; it was probably about the same in 1926.9

Germany. In spite of a very high mortality, the net reproduction rate was in the three decades from 1881-90 to 1901-10: 1.448, 1.512, and 1.480, respectively. In 1925, it was 0.937 only, with a gross reproduction rate of 1.132. In 1926, the gross reproduction rate was about 1.07 and the net reproduction rate presumably about 0.89.10

England and Wales. Between 1921 and 1926, the gross reproduction rate dropped from 1.312 to about 1.05. The net reproduction rate which in 1921 had been 1.087 was about 0.88 in 1926.¹¹

In all Western and Northern Europe, the gross reproduction rate in 1926 has been about 1.12. Since the net reproduction rate in all probability did not exceed five-sixths of the gross reproduction rate, the net reproduction rate in all probability did not exceed 0.93.

In the eighties of the last century, the net reproduction rate in Germany, Denmark, Sweden, and Finland was 1.4 or 1.5. The total number of children (boys and girls) born to each woman and becoming parents in their turn, then, averaged three. This means a doubling of the population within two generations. Conditions were more or less the same in the other countries of Western and Northern Europe with the exception of France and Ireland, where the number of children to each woman probably was about

^o In 1927, it dropped to about 0 91.

¹⁰ In 1927, it dropped to about 0.83.

¹¹ In 1927, it dropped to about 0.82.

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two: the population there only held its own. In 1926, the net reproduction rate was 1.1 in Denmark and Finland, but less than 1 in France and Sweden, and especially in England and Germany. The total number of future parents (boys and girls) born to each woman in 1926 was still higher than two in some of the smaller countries, but it was lower than two in all the larger countries. The average number was about 1.9. This means that the population does not hold its own.

According to the fertility and mortality in Western and Northern Europe in 1926, 100 mothers give birth to 93 future mothers only. With the fertility of 1926 the population is bound to die out unless mortality of potential mothers decreases beyond reasonable expectations. And fertility continued its downward path in 1927.

CHAPTER IV

PRESENT AND FUTURE BALANCE

In 1926 the number of births in Western and Northern Europe (3,613,000) exceeded the number of deaths (2,449,000) by 1,164,000 or 48 per cent. How is it to be explained that in spite of such a surplus of births the population did not reproduce itself but had a virtual deficit of about 7 per cent? How is it to be explained that with a birth rate of 19.2 and a death rate of 13.0 the population does not hold its own? The answer to these most pertinent questions is to be found by a study of the age composition.

In the present population of Western and Northern Europe the proportion of women in child-bearing age is particularly large and the proportion of young children and old persons particularly small. The population of a given territory is equal to the number of persons born in that territory in the last 100 years minus the number of persons who died in that territory in the last 100 years. If the number of

¹ It would be more accurate to add. plus the number of persons who immigrated into that territory in the last 100 years minus the number of persons who emigrated from that territory in the last 100 years; but although, there was some immigration from Eastern and Southern Europe and a rather considerable emigration to overseas, we may neglect the migratory movements since they had no decisive influence upor the age composition of the population of Western and Northern Europe as a whole.

births in those 100 years remains constant or increases. and if the number of deaths does not fluctuate conspicuously, there will be more children under five years than from five to ten years, more children from five to ten years than from ten to fifteen years, etc. In the actual population of Western and Northern Europe - see the table on page 57 and the graph on page 58 — there are more children of 10 to 15 years than of under five years or of five to ten years; there are more persons of 15 to 20 years than in any lower age group; there are more persons of 20 to 30 years than under 10 years, and there are very few persons over 65 years. If we compare the age composition of the two sexes, we find a small excess of males in the lowest four age groups, while in all other age groups there is an excess of females, which is especially large in the ages of 25 to 45 and of over 60 years.

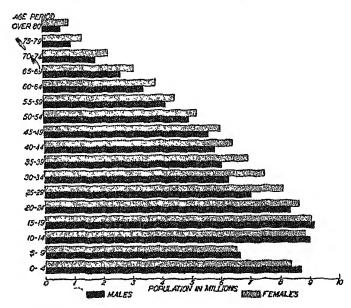
The decisive factor in shaping the age composition of the present population of Western and Northern Europe was the trend of births. The average yearly number of births, which had been 3,481,000 in 1841–45, increased to 4,210,000 in 1871–75 and to 4,686,000 in 1901–05, then dropped to 4,337,000 in 1911–14 and to 3,916,000 in 1920–26, after having been as low as 3,064,000 in 1915–19. It is evident that with such a trend in the number of births there must at present be comparatively few children under five years (born in 1921–25) and very few children from five to ten years (born in 1916–20), while there should be very many persons of 15 to 50 years (born in 1876–1910) and comparatively few older persons (born before 1876). This is actually the case for the female sex but not for those age

groups of the male sex which have been decimated through the war, that is, the present age groups from 25 to 45 years.

APPROXIMATE AGE COMPOSITION OF POPULATION, 1926

YEARS OI AGE	MALES (in millions)	Pemales (in millions)	Total (in millions)	Males Per Cent	Females Per Cent	Total Per Cent	FEMALES PER 100 MALES
0-5 5-10 10-15 15-20 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60 60-65 65-70 70-75	8 69 6 64 8.92 9 18 8.33 7 03 6.30 6.04 5.82 5.61 4.96 4.16 3.40 2.58 1.75	8.35 6.55 8.77 9.07 8.67 8.11 7.51 6.97 6.43 6.00 5.22 4.45 3.78 3.06 2.18	17 04 13.19 17.69 18 25 17.00 15.14 13.81 13.01 12 25 11.61 10.18 8.61 7.18 3.93	4.61 3.53 4 74 4.88 4 43 3.73 3.35 3.21 3.09 2.64 2.21 1.80 0.93	4.44 3.48 4.66 4.82 4.60 4.31 3.99 3.70 3.41 3.19 2.77 2.36 2.01 1.63 1.15	9.05 7.01 9.40 9.70 9.03 8.04 7.34 6.91 6.50 6.17 5.41 4.57 3.81 3.00 2.08	96 99 98 99 104 115 119 115 110 107 105 107 111 1119 124
75-80 Over 80	0.95	1.32 0.88	2.27 1.47	0.50 0.31	0.70 0.47	1.20 0.78	139 149
Total	90.95	97.32	188 27	48.31	51.69	100.00	107

The age composition of the population of Western and Northern Europe tends to lower the number of deaths. Mortality is everywhere very high among the youngest children and among the oldest persons while it is practically negligible in the age from two or three until about fifty years. Since at present the number of young children and of old persons is small, the death rate necessarily must be low. It actually is not higher than 13 per 1,000. But this low rate cannot possibly last with present mortality. The parsons between 15 and 50 years, who now are so numerous,



AGE COMPOSITION OF POPULATION OF WESTERN AND NORTHERN EUROPE, 1926

will grow older and will thereby swell those age groups where death claims most victims, while there are not sufficient children to fill up the age groups which are more or less secure against death. The present death rate of 13 per 1,000, is therefore, taken by itself, misleading. That it cannot permanently last can moreover be easily realized by a simple logical consideration. A death rate of 13 per 1,000 means that $\frac{13}{1000}$ or $\frac{1}{77}$ of the population die within a year, and if such a rate were permanent, it would mean that

the average length of life is 77 years. But the length of life, of course, is actually much lower in every country of Western and Northern Europe. Even in Denmark, with its exceptionally low mortality, the mean length of lie in 1921-25 was 61 years. Denmark in that period had 11.3 deaths per 1000 inhabitants, but the death rate derived from the actual mortality in the individual years of age was $\frac{1}{61}$, or 16.4 per 1,000. By a similar process we find as corrected death rates for England 1920-22: 17.3 (crude death rate 12.4), Scotland 1921: 18.3 (13.6), Germany 1921-1923: 18.7 (14.0).2 The difference between the crude death rate, that is the number of deaths per 1,000 inhabitants, and the corrected death rate, that is the rate derived from the mortality in the individual years of age is not as large in all countries of Western and Northern Europe. It is rather small, for instance, in France, where the number of births has not changed very much in the course of the last forty years. But there the crude death rate is comparatively high—it amounted to 17.2 in 1921–25 and to 17.5 in 1926. The main reason is that in France the number of old people is comparatively high. In spite of the fact that mortality in France has by no means been particularly favorable, the percentage of persons over 50 years is 25 per cent as compared with 20 per cent in the rest of Western and Northern Europe, simply because France - on account of the greater stability in the numbers of births -

² For Germany see Statistik des Deutschen Reichs, Vol. 316, p. 50*. The other figures have been derived from the mean length of life as given in the official statistics of the individual countries,

has a more regular age composition. Yet, even in France the proportion of old persons is smaller than it would be if the present infant mortality had prevailed at the time when, the persons now over fifty years were born. Even in France the corrected death rate is higher than the crude death rate. The statistics so far available for 1926 do not enable us to ascertain accurately the corrected death rate for all Western and Northern Europe, but they indicate that this corrected death rate must have been between 17 and 18 per 1,000.

The age composition of the population of Western and Northern Europe tends to swell the number of births. Since at present the proportion of children and of old persons is comparatively small, the number of births must be comparatively high. But the women who now are in childbearing age will by and by pass this stage and will have to be fully replaced if with present fertility the number of births is not to decrease. The chances of such a replacement in the near future are easy to ascertain. In 1926 there were in Western and Northern Europe 23.67 million females under 15 years and 25.85 million females from 15 to 30 years. It is evident that even if all girls who now are under 15 years reached child-bearing age, they would by no means be able to replace those who now are between 15 and 30 years. This result, of course, is partly due to the reduction of births during the war. But even if there had lived in 1926 as many girls of 5 to 10 and of 10 to 15 years as of under 5 years, the girls of under 15 years (who then would number 25.06 millions) would not suffice fully to replace those of 15 to 30 years.

The situation with which we are confronted can perhaps best be realized by starting from the present number of female births. The total number of female births in 1926 was 13/4 millions. The total number of women from \$\tilde{4}5\$ to 50 years was 523/4 millions. If the number of female births continued to be 13/4 millions and if no death occurred, there would be in fifty years from now $1\frac{3}{4} \times 35 = 61\frac{1}{4}$ million women between 15 and 50 years or considerably more than at present. But according to the mortality of 1926, the average number of years which the newly born girls may expect to live in the age of child-bearing is 29. If, then, the number of female births continues to be 134 millions. and if mortality remains what it was in 1926, the number of women between 15 and 50 years, fifty years from now, would be $1\frac{3}{4} \times 29 = 50\frac{3}{4}$ millions only as compared with 523/4 millions in 1926. But with present fertility the number of births is bound to decrease before that. since the number of women now between 15 and 30 years cannot be replaced by those now under 15 years of age.

The 1926 birth rate of 19.2 per 1000 is then quite misleading. How much it differs from the corrected birth rate can easily be shown for females. The number of female births in 1926 was $1\frac{3}{4}$ millions. The total number of females was $97\frac{1}{3}$ millions. The number of female births per 1,000 females then was 18. According to the fertility and mortality of 1926, the number of children born to 1,000 newly born girls was about 930. If we assume that the mean length of life according to the mortality of females in 1926 was about 58 years, the yearly number

of female births to 1,000 females would have been $\frac{930}{58} = 16$. The corrected female birth rate then was 16 per 1,000 as compared with a crude female birth rate of 18 per 1,000.

With a fertility and mortality as they prevailed in Western and Northern Europe forty or fifty years ago, the population would have doubled in three generations. With a fertility and a mortality as they have prevailed for some years, the population of Western and Northern Furope is bound to die out. This process, of course, will be rather slow. With the present age composition it would take decades until there actually would be an excess of deaths over births, and it would take centuries until the population would be half of what it is now. The process will be accelerated if emigration continues, while it will not. of course, be affected by immigration since we are concerned only with the present population and its descendants.8 It can be stopped by an essential change in mortality or in fertility. But the future reduction of mortality in those ages which are the only decisive ones, that is, those under fifty years, cannot be very great after all that has already been accomplished. The future then depends mainly on the trend of fertility.

³ It may however be noted incidentally that a yearly addition of 100,000 women in child-bearing age, by immigration or by birth to future immigrants, would suffice to re-establish the equilibrium between births and deaths.

APPENDIX A

BIRTHS AND BIRTH RATES

THE birth rate is the rate of newly born per 1,000 of the average population in a definite territory. We must, therefore, consider the meaning of (1) births, (2) average population, (3) territory.

I. BIRTHS

The newly born in vital statistics are usually subdivided into live-born and still-born. Since the statistical definitions of live-born and still-born have changed in the course of time and also vary between different countries, it may at first sight seem preferable to neglect any distinction and to consider only total births. But some countries, like Great Britain, do not register still-births at all. We shall, therefore, confine ourselves in this international study to the live-born. The reader should, however, keep in mind that the numbers of live-born and consequently the birth rates which we give in this book are slightly affected by the definition of live-born in use at the different periods and in the various countries. It would exceed our scope to give a detailed analysis of those definitions. It may suffice to mention a few examples which will show that the live-born in England or Denmark, for instance, include newlyborn that in France and Belgium would be registered as still-. born.

England and Wales. The statistics of live-born include all children born who have shown any sign of life after birth.

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A still-born child is one which, after complete expulsion from the body of the mother, has neither breathed nor shown any signs of life. It should be noted that any child born and living for any time, however short, is regarded as live birth.¹

Denmark. Same as England.

Prematurely born children born alive to be recorded as live births. Any feetus born without obvious signs of life in the 29th week of pregnancy or after should be recorded as a stillbirth; but if before the 29th week it should be deemed a miscarriage and not recorded.²

Belgium. The statistics of live-born exclude children who were born alive but who died within three days after birth without birth registration.

Officially, a "still-birth" is defined as the birth of a dead child after the 180th day of gestation, but according to established procedure, under "still-born" are included:

- (a) Children born dead.
- (b) Children born alive, but dying before registration (i.e. within three days of birth).

A circular issued by the Ministry of the Interior in 1880, which is still in force, states:

The returns of still-births compiled from the registry of deaths may include not only children actually born dead, but also children who, although born alive, died on the first, the second, or even the third day after birth, but who must be regarded as still-born, since they were not returned as livebirths to the Public Registrar, and consequently could not be entered in the register of births.³

- League of Nations, Health Organization. Statistical Handbooks Series: No. 3, Official Vital Statistics of England and Wales, p. 45.
 - ² Statistical Handbooks Series: No. 6. The Official Vital Statistics of the Scandinavian Countries and the Baltic Republics, p. 72.
 - Statistical Handbooks Series: No. 2, The Official Vital Statistics of the Kingdom of Belgium, p. 26; for full text of the circular, see ibid., pp. 23-74.

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The number of children born alive, but dying before registration, amounted in 1881–1913 and 1919–25 to 0.74 and 0.7 per cent of the live-born and to 16.0 and 15.0 per cent of the "still-born."

AVERAGE YEARLY NUMBER OF LIVE-BIRTHS AND STILE-BIRTHS IN BLIGIUM, 1881-1925 *

		"Still-Born"					
Years	LIVE-BORN	Dead at Birth	Dying before Registration	Total			
1881–1890 1891–1900 1901–1910 1911–1913 1919–1925	175,828 186,544 187,549 171,363 152,415	7,241 7,318 7,097 6,412 6,186	1,195 1,448 1,470 1,316 1,092	8,436 8,766 8,567 7,728 7,278			

^{*}See Annuaire Statistique de la Belgique et du Congo Belge 1912, pp 108-9, 1024-1925, pp. xxx, xxxiii, 37.

Holland. Prior to 1918: same as Belgium; from 1918 to 1923: (1) same as Belgium, (2) all live-born children (excluding the living fectuses of less than six months); from 1924 on: (2) only. The statistics from 1924 on, then, include among the live-born births which would not have been included prior to 1918. The number of such births in 1918–23 amounted to 1.03 of the live-born and to 30.0 per cent of the "still-born."

France. Same as Belgium. For 1907-24 the percentage of children who breathed but were excluded from the statistics

⁴ See Jaurcijfers voor Nederland 1927, p. 13. It is interesting to note that this percentage was evidently much higher than the Dutch registration officers themselves had assumed, since some years prior it had been officially "estimated that somewhere about 15-20 per cent of the children so entered were born alive" (see Journal of the Royal Statistical Society, December, 1912, Vol. LXXVI, p. 65).

of live-born amounted to 0.73 per cent of the actually live-born

and to 15.2 per cent of the "still-born."5

The reader should further keep in mind that the registration of births, especially during the earlier registration years, was not complete. In England and Wales, for instance, where civil registration began on July 1, 1837, an unknown number of births was not recorded until, through the Births and Deaths Registration Act of 1874, the registration of births was made compulsory, and omission to register became a punishable offence. The deficiency in birth registration for 1837–76, according to an estimate of the Registrar-General, Dr. Farr, averaged 5 per cent.⁶ In the last quarter of the nineteenth century and up to 1914 registration was practically complete all over Western and Northern Europe.⁷ But the world war again shattered the accuracy of the birth records, especially in the occupied territories of France, etc., and complete registration could only be re-established in 1920.

Wherever registration is deficient, the statistical authorities may or may not fill the gaps. In the case of England and Wales, for instance, no attempt apparently has ever been made to revise the yearly births data which were somewhat incomplete prior to 1876. In the case of the occupied territories of France, on the other hand, the French Statistical Office has made a careful, though, of course, quite uncertain estimate

⁵ See Statistical Handbooks Series: No. 9, The Official Vital Statistics of the French Republic, pp. 70–74, and Statistique Générale de la France, Statistique du Mouvement de la Population, New Series, Vol. IV, p. LXXIX.

⁶ See Official Vital Statistics of England and Wales, p. 29.

⁷ See for some details "Report of Special Committee on Infantile Mortality,"

"Journal of the Royal Statistical Society, December, 1912, pp 52-59, 81.

Conditions prior to 1918 were not altogether satisfactory in Finland (see The Official Vital Statistics of the Scandinavian Countries and the Baltic Republics, pp. 38-39).

of the births in 1914-19.8 We have used in both cases the official figures as they stand

There are, however, still other cases, where the registration may have been complete, but where on account of changes in political sovereignty statistics have not been compiled or at least not published. No statistics, for instance, are available for Alsace-Lorraine in 1917-18, the German statistics stopping with 1916, the French statistics starting with 1919. German Statistical Office, it is true, has made an estimate of the births in all Germany by "increasing the figures of those two years by 1/40, which part about corresponds to the share of Alsace-Lorraine": but this estimate does not seem adequate. since the share of Alsace-Lorraine which indeed had been about $\frac{1}{40}$ before the war was only $\frac{1}{47}$ in 1915 and in 1916. We have, therefore, assumed that the share of Alsace-Lorraine, which suffered particularly from the war, was the same for 1917 and 1918 as for 1915 and 1916. Similar estimates have been made in this book for other territories ceded by Germany for which birth statistics are lacking in the first post-war years.

Attention must finally be called to the fact that in compiling birth statistics some countries use the *de facto* enumeration, while others have accepted a *de jure* method (by including children born at sea and excluding the births of mothers with a foreign residence), and that some countries include for a given period the number occurring while others include the number registered during that period. These, however, are negligible differences.

⁸ See Statistique du Mouvement de la Population, New Series, Vol. III, pp. 148-172.

² Statistik des Deutschen Reichs, Vol. 276, p. XXXIII.

II. AVERAGE POPULATION

The birth rate is the rate of newly born per 1,000 of the average population in a given period. But the average population is never exactly known for any period. The only reliable data are census figures and those very figures, even assuming them to be complete, are not always comparable, since they may refer either to the de facto population or to a de jure population, the latter including residents living abroad (also soldiers) and excluding foreigners with a foreign residence. As to the period between two censuses, only estimates, as a rule, are Those estimates which usually are based on the available. more or less reliable statistics of births and deaths and the more or less unreliable statistics of immigration and emigration refer either to the end of each year or to the middle of each year or to the mean (average of beginning and end) of each year. In computing the birth rate for a given year, the mean population certainly is preferable to the mid-year population, and wherever we had ourselves to compute birth rates we have used as a basis the mean population, taking it from the official statistics when it was so given or computing it by ascertaining the average of the population at the end of the preceding year and at the end of the year under consideration. We have applied this method also in the case of Belgium, where in the official statistics the birth rate for each year is erroneously computed by relating the births to the population at the end of the year.

If the period under consideration does not exceed one year, the population at the middle of the year probably will not differ much from the average population of the year, and we have therefore taken as they stand official birth rates computed on the basis of the mid-year population. But if the period under consideration covers a much larger period, say ten years,

the error caused by relating the births of that period to the population in the middle of the period may become considerable. The French Statistical Office, in a most comprehensive international survey made before the war, has published, aside from many correctly computed birth rates by years and by longer periods, special decennial birth rates by relating the average yearly births to the mid-period population. How much the results of this method (a) differ from those of the correct method (b) which consists in relating the average yearly births to the average population may be seen from the following table of Sweden: 10

Newson	Вікти	RATL	Period	Birro	BIRITI RATE		
Period	(a)	(b)	PERIOD	(a)	(b)		
1756–1765 1766–1775 1776–1785 1776–1785 1786–1795 1796–1805 1806–1815 1816–1825	34 7 32 3 32 9 33 8 32 1 32 2 35.0	34 4 32 5 33 2 33 0 32.0 31 6 34 8	1826-1835 1836-1845 1846-1855 1856-1865 1866-1875 1876-1885 1886-1895	32 9 31 1 31 3 33 4 30 6 29.7 28 1	32 9 30 9 31 4 33.4 30 2 29 8 28.1		

We, therefore, have discarded all birth rates for periods of over two years based on the mid-period population, and have as a matter of principle computed such birth rates by relating the average yearly births to the average population of the period.¹¹

¹⁰ The results of method (a) have been taken from Statistique Internationale du Mouvement de la Population, Vol. I, p. 196; the results of method (b) have been computed from data given in Statistisk Årsbok for Sverige 1027, pp. 47-48.

[&]quot;We thus give the birth rate for the entire period reduced to one year. This birth rate is not necessarily identical with the average of the yearly birth rates, which is obtained by dividing the total of the yearly birth rates

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Attention should, finally, perhaps be called to the fact that we trend of yearly birth rates is slightly affected by the number of days in a year. The increase in the birth rate of Finland from 36.6 in 1875 to 36.7 in 1876, does not represent an actual increase, since 1875 was a common year and 1876 a leap year.¹²

by the number of years covered by the period. In official publications both rates sometimes are indiscriminately used without much care about terminology, although, theoretically, the two methods vary a great deal. In practice, they would lead to very different results in extreme cases only. Let us assume four different countries with the following development in a triennial period.

	1	3	(2	D			
Year	Popu- lation	Births	Popu- lation	Births	Popu- lation	Births	Popu- lation	Births
1st 2nd	100,000 200,000 300,000	2,000 6,000 12,000	100,000 200,000 300,000	4,000 6,000 6,000	300,000 200,000 100,000	6,000 6,000 4,000	300,000 200,000 100,000	12,000 6,000 2,000

The average yearly birth rate would be in all countries 30, while the triennial birth rate, reduced to one year, would be in countries A and D 33.33, in countries B and C 26 67. But such great changes in population and birth rates actually never occur and the difference between the results of the two methods is usually negligible.

In the very few cases where the yearly birth rates only were available we have, then, computed the birth rate for the period by taking the average of the yearly birth rates. But when not otherwise stated, our birth rates by periods represent the birth rate for the entire period reduced to one year.

¹² A casual reader might object that it represents an actual increase after all since Finland counts the births according to the date of registration and 1876 with its 53 Sundays had no more registration days than 1875. But such an objection would be utterly futile. Registration in Finland is made by the clergy and can be effected on Sundays as on week-days.

III. TERRITORY COVERED

The birth rate as originally published by the statistical office of an individual country usually refers to the territory of that time. But when boundaries change, the office, assuming thereby to present a better basis of comparison between birth rates of former and of recent times, frequently endeavors to compute, for the past, birth rates corresponding to the new boundaries of the country and from then on publishes the revised rates only. When boundaries change again, it often occurs that the data necessary for a new revision of the original rates are not available, and the official statistics of many countries, therefore, contain a series of birth rates which partly correspond to the former territory and partly to the present territory. The confusion resulting from a change in boundaries is sometimes so great that the statistical office itself no longer knows to which territory its data refer. The French Statistical Office, in computing the birth rate for the quinquennial period 1866-70, has thus at one time excluded the births of Alsace-Lorraine in 1869-70, but included the population of Alsace-Lorraine for all those years.13

In our opinion, a comparison of birth rates for the territory within the political boundaries at various times is at least as instructive as a comparison of birth rates computed wholly with respect to the territory now so comprised. We have on the whole no serious objections to a comparison of birth rates for the present territory, if the change of boundaries has reduced the territory — although we do not find it particularly useful to study the pre-war birth rate in the present territory of countries like Austria or Hungary. But we wonder whether it may not be misleading to compare such birth rates in case the present

¹³ See Statistique Internationale du Mouvement de la Population, Vol. I, pp. 158, 162, 166.

territory includes districts which formerly belonged to another Sountry. Very little, as a matter of fact, is known about the intensity with which various factors affect the birth rate; but it is quite certain that legislation is one important factor and that the birth rate of a district is likely to change with changing sovereignty. We rather suspect, for instance, that the increase of the birth rate of Alsace-Lorraine from 29 in 1851-60 to 30 in 1891-1900, coinciding with a decrease of the French birth rate from 26 to 22, was partly due to the fact that Alsace-Lorraine in the meantime had become a part of Germany. We, therefore, do not think that the German official statistics have improved the comparability of the German birth rates by including Alsace-Lorraine for the periods preceding 1870, and we certainly find it illogical that this scheme is still adhered to after Alsace-Lorraine has been excluded from the official German birth rate since 1917.

In preparing our tables on population, births, and birth rates, we have as far as possible discarded all series which refer partly to the territory of former times and partly to the present territory. We have, however, not confined ourselves to an analysis for the territory formerly comprised, since we are quite aware that there are after all problems the solution of which requires the study of the trend of the birth rate for a geographical rather than for a political entity. We therefore add for the two countries whose boundaries have materially changed in the course of time, namely for France and Germany, some data for the present territory. In studying our tables, the reader should, however, keep in mind that although in order to avoid erroneous conclusions it is necessary to know just to what territory a birth rate refers, in a good many cases the statistical publications of the individual countries, and still more so the international compilations, do not give information that is adequate in this respect. In delimiting the territories covered by the data contained in the following tables, we will, therefore, insert the "dodge line" frequently applied to the statement in bond circulars: "They are based on information obtained from official sources and while not guaranteed are believed to be reliable."

Belgium. The official statistics (see Annuaire Statistique de la Belgique 1900, p. 90, and Annuaire Statistique de la Belgique et du Congo Belge, 1912, p. 102, 1924-1925, p. 37) give the population on December 31, 1830-1925, the yearly births for 1830-1925, and yearly birth rates for 1830-1925. The data for 1830-1919 refer te the territory for the respective years and, therefore, include for 1830-38 the parts of the provinces of Limburg and Luxemburg ceded to Holland through the treaties of April 19, 1839. The data of 1920-24 still exclude the counties of Eupen and Malmedy ceded by Germany in consequence of the Treaty of Versailles of January 10, 1920. The data for 1925 refer to the present territory.

The population of Eupen and Malmedy on December 31, 1920, is given in Aperçu Annuel de la Démographie des Divers Pays du Monde, 1922, 14 p. 3, and the population of the present Belgian territory as of December 31, 1921–26, in Aperçu 1927 pp. 4–5; the births in Eupen-Malmedy for 1921–24 are given in Aperçu 1927, p. 115, and the births in the present territory for 1926 in Moniteur belge, June 5, 1927.

The mean population in the territory respectively comprised has been computed for 1831–1919 from the official figures for December 31, 1830–1919. In order to compute the mean population for 1839, it became necessary to deduct from the official population figure for December 31, 1838, the population of the districts ceded to Holland. For December 31, 1836, the population

¹⁴ Such a survey has been published by the Permanent Office of the International Statistical Institute for 1922, 1925, and 1927. It will be quoted in this Appendix as Aperqu.

lation of Belgium has been estimated at 4,242,598 including those districts (Annuaire 1900, p. 90), and at 3,927,901 excluding those districts (ibid., p. 40). It has here been assumed that the population in the ceded districts was likewise about 315,000 on December 31, 1838. For 1920-26, the mean population in the territory as of those years (which coincides with the present territory) has been computed from the figures in A perçus 1922 and 1927, it having been assumed that the mean population of Eupen and Malmedy in 1920 was equal to that of December 31, 1920 (60,213).

The births for 1831-1919 were taken as they refe from Annuaires 1900, 1912, 1924-25. For 1920-24, the figures in the Annuaire were supplemented by those given in Aperçu 1927 for Eupen and Malmedy, it having been assumed that the number of births in 1920 was the same as in 1921 (1405). For 1925 and 1926, the births were taken as they were from Annuaire 1924-25 and Moniteur belge respectively.

Since in the Belgian official statistics the birth rate is reckoned as a rate per 1,000 of the population living at the end of the year, all yearly birth rates have been computed anew by relating the births to the mean population of the year.

Our whole series of data for Belgium 1831-1926 thus refers to the population of the respective peroid. The data for 1920-1926 refer at the same time to the present territory. In order to give data for the present territory for 1841-1919 we ought to have included for each year the figures for Eupen and Malmedy; but the population of this district is so small that it did not seem worth while to take it into special consideration.

Denmark. The official statistics (see Danmarks Statistik, Statistisk Aarbog 1922, pp. 16-18, 1927, p. 21; Statistiske Efterretninger, May 5, 1928, Vol. XX, p. 81) give the population on July 1, 1800-1927, the yearly births for 1800-1927, and the yearly birth rates for 1800-1927. The data for 1800-59

refer to the territory as before the peace treaty of October 30, 1864, through which Denmark gained an increase of 7,811 inhabitants (see Sammendrag af Statistiske Oplysninger angaæende Kongeriget Danmark, No. 1, Copenhague 1869, p. 1). The data for 1860–1920 refer to the territory as after this treaty. The data for 1921–27 refer to the present territory and include the districts ceded by Germany, June 14–15, 1920, on account of the vote of February 10, 1920.

The mean population in the territory corresponding to the periods 1800–1919 and 1921–27 has been assumed to be equal to the officially estimated population of July 1 of those years, no attempt having been made to revise the figures for 1860–64. The mean population for 1920 has been computed by adding 163,000 to the official figure, the population of the ceded districts having been 163,622 at the census of February 1, 1921 (see Statistisk Aarbog 1927, p. 11).

The births for 1800-1919 and 1921-27 were taken as they were from the official statistics. The number of births for 1920 has been computed by adding to the official figure for 1920, 3,847 births, the birth rate in Sleswig having been 23.6 in 1920 (see Statistik des Deutschen Reichs, Vol. 336, p. 4).

The yearly birth rates for 1800-1919 and 1921-27 were taken as they were from the official statistics; the rate for 1920 has been computed by relating the number of births to the mean population of the year.

With the exception of the years 1860-64, where there is a negligible deviation, our whole series of data for Denmark 1800-1927 thus refers to the population of the respective time. The data for 1920-27 refer also to the present territory. In order to give data for the present territory for 1841-1919, we ought to have taken into account for 1841-59 the slight change of boundaries that occurred in 1864 and we ought to have included for 1841-1919 the territory ceded by Germany in 1920. But neither

of those changes seems sufficiently important to deserve special consideration.

Faroe Islands, Iceland. None of the data for Denmark include the Faroe Islands or Iceland The Statistical Yearbooks of Defmark (see Statistisk Aarbog 1902, p. 174, 1903, p. 178; 1006, pp. 178, 180; 1016, pp. 209-10, 1027, pp. 183, 189; see also Statistisk Tabelværk, Fourth Series, Letter A, No. 5, p. 287; No. 7, p. 289; No. 9, p. 241) give the yearly births for the Faroe Islands in 1880-1925, and for Iceland in 1890-1925. Other official statistics of Denmark (Statistiske Meddelelser, Fourth Series, Vol. 24, Part 5, pp. 5-6, Vol. 56, Part 4, pp. 3-8) give for the Faroe Islands the births, including still-births, by periods of 10 or 11 years for 1840-1910 and the live-births by decennial periods for 1881-1910, and by periods of 5 or 6 years for 1880-1915: for Iceland the births, including still-births, for the period 1801-40 and by periods of 10 or 11 years for 1841-1901 and the live-births by decennial periods for 1881-1900. The official statistics of Iceland (see Landshagsskyrslur fyrir Ísland 1010, p. 103; 1011, pp. 204; Statistique de l'Islande, Vol. XXIV, pp. 21*, 7) give the mean population of Iceland for the decennial period 1891-1900, for the guinguennial period 1901-05, and for December 31, 1906-1915, and the live-births by decennial periods for 1876-1905. The League of Nations, Health Organization, Statistical Handbooks Series (see No. 6, The Official Vital Statistics of the Scandinavian Countries and the Baltic Republics, p. 84) gives for Iceland the births, including stillbirths, by decennial periods for 1735-1924.

In order to include the Faroe Islands and Iceland in the table covering Western and Northern Europe, still other sources and some estimates had to be resorted to. The mean population by quinquennial periods for 1841–1900 has been taken from the semi-official Swedish compilation by Gustav Sundbärg, Apergus Statistiques Internationaux, Dixième Année, p. 35. According

to the censuses of February 1, 1901, 1906, 1911, 1916, 1921, and November 5, 1925, the population of the Faroe Islands was 15,230, 16,348, 18,000, 19,617, 21,352, and 22,835. We have assumed here that the population in 1901–05, 1906–10, 1911–14, 1915–19, 1920–21, 1922–23, 1924–25, and 1926 was \$6,000, 17,000 18,000 20,000 21,000 22,000, 23,000, and 23,000. The mean population of Iceland for 1901–05 has been taken from the official statistics of Iceland, that for 1906–26 has been computed from the estimates for December 31, 1906–19, 1921–26, and the census data for December 1, 1920, given in the official statistics of Iceland and Apergu 1922, p. 4, Apergu 1925, p. 12, Apergu 1927, p. 14.

The births in 1881–1925 for the Faroe Islands and in 1891–1925 for Iceland were taken from the official Danish and Icelandish statistics. The births for 1841–80 or 1841–90 were estimated on the basis of the statements in the statistics of Denmark and Iceland, and the International Statistical Institute's Annuaire International de Statistique 1917, p. 34. The births for 1926 were taken from Apergu 1927, pp. 116–117.

In view of the small population of these islands, no separate birth rates are given, all data being used only for computing birth rates by periods for Western and Northern Europe.

England and Wales. The official statistics (see Annual Report of the Registrar-General of Births, Deaths, and Marriages in England and Wales 1881, pp. xliii, cxii, cxiv; idem, 1900, p. cxxv; idem, 1910, pp. 2-4; The Registrar-General's Statistical Review of England and Wales for the Year 1926, Tables, Part II, Civil, pp. 2-5) give the estimated mid-year population for 1801-1926, the yearly births for 1838-1926, the quinquennial births for 1841-1925, the yearly birth rates for 1838-1926, and the quinquennial birth rates for 1841-1925. The data refer to the territory during those periods which

coincides with the present territory. The population figures, however, refer for 1915-1920 to the civilian population only; estimates of the total population for those years are given in Annual Reports of the Registrar-General 1915, p. x, 1916, p. 80, 1917, p. 82, 1918, p. 19, 1919, p. 89, 1920, p. x.

The mean population in 1838-1926 has been assumed to be equal to the officially estimated total mid-year population of those years.

The yearly births for 1838–1926, the yearly birth rates for 1838–1926, and the quinquennial birth rates for 1841–1910 were taken as they were from the Annual Reports and the Statistical Review. The birth rates by periods for 1911–25 have been computed by relating the total births to the sum of the mean populations of all years covered by the period. The mean population, the births, and the birth rate for 1927 have been taken from Journal of the Royal Statistical Society, 1928, Vol. xci, pp. 295–96.

Scotland. The official statistics (see Annual Report of the Registrar-General of Births, Deaths, and Marriages in England 1881, pp. cxii-cxv; Annual Report of the Registrar-General for Scotland 1926, pp. lxxv-lxxvii give the estimated mid-year population for 1801-1926, the yearly births for 1855-1926, and the yearly birth rates for 1855-1926. The data refer to the territory in those years, which coincides with the present territory.

The mean population in 1841-1926 has been assumed to be equal to the estimated mid-year population of those years. The yearly births for 1855-1926 and the yearly birth rates for 1855-1926 were taken as they were from the official statistics. The mean population, the births, and the birth rate for 1927 have been taken from *Journal of the Royal Statistical Society*, 1928, Vol. xci, p. 298.

In order to include Scotland in the tables covering Western

and Northern Europe, it became necessary to make estimates for the births in the three quinquennial periods 1841-45, 1846-50, and 1850-55. We have here assumed that the birth rate was equal to that of England and Wales, namely 32.3, 32.8, and 33.9.

Ireland. The official statistics of Ireland (see Supplement to the Forty-Seventh Report of the Registrar-General of Marriages, Births, and Deaths, in Ireland, pp. vi, 60; Fifty-Seventh Detailed Annual Report of the Registrar-General for Ireland, p. v) give the estimated mid-year population for 1826-1920, the yearly births for 1364-1920, and the yearly birth rates for 1864-1920. The official statistics of Northern Ireland (see The Registrar-General's First Annual Report containing General Abstracts of Marriages, Births and Deaths registered in Northern Ireland during the year 1922, p. 6; Fifth Annual Report 1926, p. 6) give the estimated mid-year population for 1911-26, the yearly births for 1912-26, and the yearly birth rates for 1912-26. The official statistics of the Irish Free State (see Detailed Annual Report of the Registrar-General for Saorstat Lireann containing a General Abstract of the Numbers of Marriages. Births and Deaths registered in Saorstat Eireann during the year 1022, p. v; idem 1926, pp. viii, 68) give the estimated mid-year population for 1911-26, the yearly births for 1912-26. and the yearly birth rates for 1912-26. All data for Ireland refer to the territory of the respective periods which coincides with the present territory. The separate data of Northern Ireland and the Irish Free State for 1911-26 refer to the present territory as established in 1920.

The mean population in 1841-1926 has been assumed to be equal to the officially estimated mid-year population of those years, the mean population of Ireland for 1911-26 having been computed by adding the mid-year populations of Northern Ireland and the Irish Free State. But while, as a rule, we do

not question the official population estimates, we want to say in this connection that we think those estimates for 1842-50 to be too high. The population, according to the censuses of June 7, 1841, and March 30, 1851, was 8,196,597 and 6,574,278. The Registrar-General assumes the population to have steadily increased until 8,295,061 in the middle of 1845, and then to have decreased to 8,287,848 in 1846, 8,025,274 in 1847. 7,639,800 in 1848, 7,256,314 in 1849, 6,877,549 in 1850, and 6,514,473 in 1851. Since the emigration was already rather large in 1841-46, we cannot believe that the population still increased in the first part of the forties and, as we of course. accept the census figures of 1851, we do not believe that the population decreased by as much as 1,773,375 from the middle of 1846 to the middle of 1851. But as we have not sufficient evidence to prepare an adequate estimate of our own, we accept the official estimates for the whole period.

The births in 1864-1926 were taken as they were from the Reports of the Registrar-Generals, the births of Ireland for 1912-26 having been computed by adding the births of Northern Ireland and the Irish Free State.

The yearly birth rates of Ireland for 1864–1910 and of Northern Ireland and the Irish Free State for 1916–26 have been taken as they were from the *Reports* of the Registrar-Generals; all other birth rates have been computed anew.

The mean population, the births, and the birth rate for 1927 have been taken from *Journal of the Royal Statistical Society* 1928, Vol. xci, pp. 300-01.

In order to include Ireland in the tables covering Western and Northern Europe it became necessary to make estimates for the births in the five quinquennial periods from 1841–45 to 1861–65. We have here assumed that the birth rate was 30 in the period 1841–45, 28 in the periods 1846–50, 1851–55, and 1856–60, and 26 in the period 1861–65.

Islands in the British Seas. None of the data for Great Britain and Ireland include the Isle of Man, Jersey, or Guernsey and its dependencies. But the reports of the Registrar-General of Wales and England (see Annual Report of the Registrar-General of Births, Deaths, and Marriages in England and Wales, 1881, p. xcvii, 1889, p. lv, 1901, p. cli; The Kegistrar-General's Statistical Review of England and Wales for the Year 1926, Tables, Part II, Civil, p. 115) give separately the yearly births in those islands for 1851–1926.

In order to include the Islands in the British Seas in the table covering Western and Northern Europe, other sources and some estimates had to be resorted to. The mean population by quinquennial periods for 1841–1900 has been taken from the semi-official Swedish publication by Gustav Sundbärg, Aperçus Statistiques Internationaux, Diaième Année, p. 36. According to the censuses of April 1, 1901, April 3, 1911, and June 20, 1921, the population of those islands was 150,370,148,915, and 150,514. We have assumed here that the population was 150,000 in 1901–05, 149,000 in 1906–14, 150,000 in 1915–21, and 151,000 in 1922–26. As to the births in 1841–50, we have assumed a birth rate of 28.

In view of the small size of these islands, no separate birth rates are given, all data being used only for computing birth rates by periods for Western and Northern Europe.

Finland. The official statistics (see Éléments Démographiques Principaux de la Finlande pour les Années 1750-1890, Vol. I, pp. 39-40, Vol. II, pp. 128-29, 202-3; Annuaire Statistique de Finlande 1927, pp. 54-55; Mouvement de la Population en 1926, pp. 5, 21) give the mean population by years and by quinquennial periods for 1751-1925 as well as the population on December 31, 1925, and 1926; the births and the birth rates by years for 1751-1926 and by quinquennial periods for 1751-1925. The data refer to the territory as of those years and,

therefore, exclude for 1751-1811 the government of Wiborg annexed on December 31, 1811 (185,000 inhabitants). From 1812 on, the territory of the respective periods coincides with the present territory.

The mean population for 1751-1925 by years and for 1751-1910 by periods, the births and the birth rates for 1751-1926 by years and for 1751-1910 by periods have been taken as they were from the official statistics. The mean population for 1926 has been computed from the official figures for December 31, 1925 and 1926. The birth rates by periods for 1911-25 have been computed by relating the total births to the sum of the mean populations of all years covered by the period.

France. The official Statistical Yearbook (Annuaire Statistique 1926, pp. 11*-12*) gives the mid-year population for 1802-1926, the yearly births by thousands for 1806-1926, and the yearly birth rates for 1806-1926. The data for 1806-60 refer to the territory according to the treaty of Paris of 1815; from 1861 on they include Savoy and the part of the county of Nice ceded by Italy through the treaty of Turin of March 24, 1860; from 1869 to 1918 they exclude Alsace-Lorraine ceded to Germany through the treaty of Frankfort in 1871; from 1919 on they again include Alsace-Lorraine. The data then refer to the territory respectively comprised for 1815-68 and 1871-1926, and at the same time to the present territory for 1861-68 and 1919-26.

The mean population in the territory included in 1806-68 and 1871-1926 has been assumed to be equal to the officially estimated mid-year population of those years, no attempt having been made to revise the figures for the Napoleonic period. The mean population including Alsace-Lorraine for 1869 and 1870 has been taken from the French official publication Statistique Internationale du Mouvement de la Population, Vol. I, p. 37.

Since the yearly births are given only by thousands in the Yearbook, the actual figures had to be taken from other sources: those for 1806–1910 were taken from Statistique Internationale du Mouvement, Vol. I, pp. 36–37, Vol. II, p. 15, those for 1911–24, from Statistique du Mouvement de la Porulation, New Series, Vol. II, p 1, Vol. III, pp. 170, 172, Vol. IV, p. lxii, those for 1925–27 from Journal Officiel de la République Française, May 5, 1928. The births in Alsace-Lorraine for 1869–70 were taken from Statistique Internationale du Mouvement, Vol. I, p. 32. The births by quinquennial periods for 1806–1910 have been taken from ibid., Vol. I, p. 158, Vol. II, p. 62*, the figure for 1866–70 having been revised by including for 1869 and 1870 Alsace-Lorraine.

The yearly birth rates for 1806–1868 and 1871–1927 have been taken as they were from Annuaire Statistique 1926, pp. 11*–12*, and Journal Official de la République Française, May 5, 1928, those for 1869 and 1870 were computed by including Alsace-Lorraine. The quinnenial birth rates for 1806–1865 and 1871–1910 were taken as they were from Statistique Internationale du Mouvement, Vol. I, p. 166, Vol. II, pp. 68–69. The birth rates for 1866–70 and for the periods from 1911–14 on, have been computed by relating the total births to the sum of the mean populations of all years covered by the period.

Aside from this series of data referring for 1815-1926 to the territory of the time considered, it was deemed advisable, as has been explained before, to give for 1841-1926 data referring to the present territory. In order to do this, Savoy and the part of Nice, ceded by Italy in 1860, had to be included for 1841-60, and Alsace-Lorraine had to be included for 1871-1918. There exist neither population nor birth statistics prior to 1861 for the territories ceded by Italy. Their population, according to the French census of April/May, 1861, was 669,059 (see Resultats Généraux du Dénombrement de 1861, pari). We have

here assumed that the mean population in the four quinquennial periods from 1841–45 to 1856–60 was 593,000, 614,000, 635,000, and 657,000, and that the birth rate all the time was 35. As to Alsace-Lorraine, the mean population and the births for 1871–1910 have been taken from Statistik des Deutsches Reichs, Vol. 240, p. [132]. The mean population for 1911–16 has been taken from Statistik des Deutschen Reichs, Vol 256, p. 4, Vol. 266, p. 4, Vol. 275, p 4, Vol. 276, pp. 4, 134, 264; the mean population for 1917–18, in accordance with Vol 276, pp. xxii, (4), (116), has been assumed to have been the same as in 1916; the births for 1911–16 have been taken from Vol. 275, pp. 13*, 17*, Vol. 307, pp 9*, 12*, the births for 1917 and 1918 have been assumed to have been, as in 1915–16, ½ of the births in all Germany.

Germany. The official statistics (Statistik des Deutschen Reichs, Vol. 44, p. 2, Vol. 240, p. [110], Statistisches Jahrbuch fur das Deutsche Reich 1927, pp. 8, 28, Wirtschaft und Statistik, 1928, pp. 114, 380) give the mean population for 1841-1926, the yearly births for 1841-1927, and the yearly birth rates for 1871-1927, all data being given for 1841-1870 also by quinquennial periods. The population data for 1841-1918 refer to the pre-war territory, those for 1919 to the pre-war territory without Alsace-Lorraine and the part of the province of Posen ceded to Poland. Those for 1920 and 1921 are as for 1919 but without the Memel Territory, the Free City of Danzig, the territories ceded to Poland without plebiscite, to Czechoslovakia, Denmark, and Belgium. Those for 1922-27 are as for 1920-21, but without the part of Upper-Silesia ceded to Poland according to the note of the Ambassadors' Conference of October 20, 1921. Since Alsace-Lorraine belonged to France until 1871, and since the Saar Territory has been at least temporarily separated from Germany through the Treaty of Versailles, this series of population data refers only to the territory of the years specified for 1871–1919. The Statistical Yearbook 1927 (p. 8) contains, however, another series of population data for 1920–26 excluding the Saar Territory, and this series, then, refers to the territory of the time specified and for 1922–26 also to the present territory. The birth figures for 1841–1916 and the birth rates for 1871–1916 refer to the territory of the corresponding period, and, therefore, exclude the Island of Helgoland for 1871–90; from 1917 on, they are exclusive of Alsace-Lorraine; for 1919–20 they correspond to the first, and for 1921–26 to the second series of population data. This series of births and birth rates, then, refers for 1871–1916, 1919, and 1921–27 to the territory of the time in question, which for 1922–27 coincides with the present territory.

In order to establish a continuous series from 1841 to 1927 for the territory of the time specified, first of all, Alsace-Lorraine had to be excluded for 1841-70. It may perhaps appear altogether preposterous to speak of a "Germany" before the Empire was founded, yet for statistical purposes it seems justifiable to anticipate for 1841-70 the later Empire, only excluding Alsace-Lorraine which during that whole period belonged to France. The mean population and the births of "the territory of the time specified" were then computed for 1841-70 by deducting from the official figures the mean population and the births in Alsace-Lorraine (see Statistik des Deutschen Reichs, Vol. 44, p. 48), the birth rates being then arrived at by relating the births to the mean population. The mean population for 1871-1926 and the births and the birth rates for 1871-1916, 1919, and 1921-27 were taken from the official sources. for 1917-18 were arrived at by adding for Alsace-Lorraine 1/47 of the figures in Statistical Yearbook 1927, p. 28; the births for 1920 by deducting the births in the Saar Territory (see Bericht des Statistischen Amtes des Saargebietes, Vol. V. p. 39). In order to establish a continuous series from 1841 to 1927 for the present territory a great mass of computations would be necessary since the territory of the time considered coincides for 1922-27 only with the present territory, and since boundaries have changed materially. The German Statistical Office (Statistik des Deutschen Reichs, Vol. 336, p. 1) has estimated the number of births in the present territory for 1913 and 1919-21. These figures were taken as they were for 1919-21. As to the mean population of the present territory, we have estimated it for 1919 at 59,500,000 and for 1920-21 at 60,500,000. For the periods preceding 1919, it would have been necessary first to include for 1841-90 the Island of Helgoland. second to exclude for 1871-1918 Alsace-Lorraine and for 1841-1918 the other territories ceded as a consequence of the Treaty of Versailles as well as the Saar Territory. The population of Helgoland, when the island came to Germany, was so small (2,000 inhabitants) that it could be altogether neglected. The exclusion of Alsace-Lorraine was carried out along the lines described above (see France). For the territories ceded to Poland, to the Free City of Danzig, to the Memel Territory. and to Czechoslovakia, the necessary deductions, unfortunately, could not be effected in a clean-cut manner, since no separate statistics are available for those territories for the time preceding their cession. A rather crude method had, therefore, to be applied in estimating their population and births for 1841-1918. In 1910, according to the census, the total population of those territories amounted to 4,375,275 or 6.74 per cent of the total population of Germany (64,925,993). If this percentage had stayed the same for the whole period under consideration and if the birth rate had been all the time the same in the ceded districts as in the remainder of Germany, all that would be necessary would be to deduct for each year 6.74 per cent from the population and from the number of births of Germany, But the percentage of the population living in those districts

had been considerably larger in former times, and their birth rate always was especially high. No uniform percentage, therefore, can be applied either to the basic population nor to the births. It then becomes necessary to first ascertain in which provinces the ceded districts were located.

			Population 1910	
Province		Toral	IN CEDID TERRITORY	PER CENT
East Prussia West Prussia	: :	2,064,175 1,703,474 1,716,921 2,099,831 5,225,962	166,025 1,295,334 224 1,946,461 967,231	8.04 76.04 0.01 92.70 18.51

Pomerania can be neglected, since the ceded district was quite unimportant. As to the other four provinces, we have assumed that the ceded districts comprised always the same percentage of the population of the province to which they belonged as in 1910, and that the birth rate was always the same in the ceded district as in the entire province. The following percentages were then deducted from the population and from the number of births in Germany (including Alsace-Lorraine):

Period									POPULATION	Birtas	
1841-50 .		•								7.8	9.2
1851-60 .									٠.١	7.9	9.3
1861-70 .									.	8.0	9.3
1871-80 .									. i	7.9	8.8
1881-90 .										7.6	8.6
1891-1900					-			Ĺ		7.2	8.3
1901-10 .			-					Ċ		6.9	8.1
1911-18 .	·				Ċ	Ċ		Ċ	. 1	6.7	8.1

As to the Saar Territory, the population for December 1, 1910. could be taken from the German official statistics (see Statistisches Jahrbuch fur das Deutsche Reich 1927, p 10) and the population of December 31, 1911-1918 as well as the births in 1911-18 from the Saar Territory's official statistics (see Saar Territory). The mean population has been computed from the official figures (by assuming for 1911 that it was equal to the average of the population on December 1, 1910, and December 31, 1911). But no attempt has been made to make any deduction for the Saar Territory in 1841-1910. The same is true for the territories ceded to Belgium and Denmark. The population of Eupen and Malmedy, being 60,003 on December 1, 1910, and 60,213 on December 31, 1920, has been assumed to have been 60,000 in each year from 1911 to 1918, while the birth rate has been estimated equal to that of the whole province of Rhineland. The population of the part of Sleswig ceded to Denmark, being 166,348 on December 1, 1910, and 163,622 on February 1. 1921, has been assumed to have been 167,000 in 1911-14 and 165,000 in 1915-18 while the birth rate has been estimated equal to that of the whole province of Sleswig.

The reader should then keep in mind that the data for the mean population and the births in the "present territory" of Germany are not altogether homogeneous: they include for 1841–1910 the Saar Territory and the districts ceded to Belgium and Denmark, i.e. territories with 878,000 inhabitants at the end of that period.

Saar Territory. The official statistics (see Bericht des Statistischen Amtes des Saargebieles, Vol. V, p. 39) give the population on December 31, 1911-26, the yearly births and the yearly birth rates for 1911-26. All data refer to the present territory. The Saar Territory has not been included in the tables as a separate country, but the data have been used in compring the population and the births in the

present territory of Germany for 1911-18 and in Western Europe for 1919-26.

Holland. The official statistics (see Jaarcijfers over 1887 en vorige Jaren, p. 8; Jaarcijfers voor het Koninkrijk der Nederlanden Rijk in Europa 1904, p. 8, 1915, p. 11; Jaarcijfers voor Nederland 1923-1924, p. 11, 1927, p. 13) give the mean population, the yearly births, and the yearly birth rates for 1870-1927. Methorst 15 gives the yearly birth rates from 1840 on. The mean population, the births and the birth rates by quinquennial periods are to be found in Statistique Internationale du Mouvement de la-Population, Vol. I, pp. 156, 162, 165. All data refer to the territory corresponding to the respective years, which for the entire period coincides with the present territory.

For 1841-70 the mean population and the births have been taken from Statistique Internationale du Mouvement, the yearly birth rates from Methorst; the birth rates by quinquennial periods have been computed by taking the average of the birth rates given by Methorst, which do not altogether agree with those in Statistique Internationale du Mouvement, Vol. I, p. 33. For 1871-1927 the mean population, the births, and the yearly birth rates have been taken from Jaarzijfers; the birth rates by periods have been computed by relating the total births to the sum of the mean populations of all years covered by the period.

Luxemburg. The official statistics (see Note Statistique, Extruit de L' "Annuaire Officiel 1928," p. 6) give the yearly births and the yearly birth rates for 1891–1926. The data refer to the territory corresponding to the respective period coinciding uniformly with the present territory.

In order to include Luxemburg in the table covering Western and Northern Europe, other sources and some estimates had

¹⁵ Methorst, H. W. (director of the central statistical bureau of Holland), "Results of Differential Birth Rate in the Netherlands" in *Proceedings of the World Population Conference* 1027, p. 173,

to be resorted to. The mean population by quinquennial periods for 1841–1900 has been taken from Sundbärg's Apergus Statistiques Internationaux, p. 37, the mean population for 1901–1910 from Statistique Internationale du Mouvement de la Population, Vol. II, p. 14. According to the censuses of December 1, 1910 and 1916, the population was 259,891 and 263,824; for December 31, 1921, the International Statistical Office has estimated the population at 261,236. We have here assumed that the mean population was 262,000 in 1911–14, 263,000 in 1915–19, and 261,000 in 1920–21. For the years 1922–27, the mean population has been computed from the estimates for December 31, 1921 to 1926, published in Apergu 1927, p. 18, and Bulletin Mensuel (published by the International Statistical Institute), May 1928, p. 45.

The births for 1891-1926 were taken from the official statistics, those for 1927 from *Bulletin Mensuel*, August 1927, p. 89, November 1927, p. 45, February 1928, p. 45, May 1928, p. 45. For 1841-90, the births were estimated by assuming that the birth rate was equal to that of Belgium.

In view of the small size of the country, no separate birth rates are given, all data being used only for computing birth rates by periods in Western and Northern Europe.

Norway. The official statistics (see Statistiske Oversikter 1926, pp. 4-9; Statistisk Årbok for Kongeriket Norge 1926 og 1927, pp. 4, 16-17; Statistiske Meddelelser 1928, pp. 90-92) give the population on July 1, by years for 1735-1925 and by quinquennial periods for 1735-1925 as well as the population on December 31, 1925, 1926, and 1927; the births and the birth rates by years for 1735-1927 and by quinquennial periods for 1735-1925. The data refer to the territory corresponding to the respective period coinciding uniformly with the present territory.

The mean posulation for 1735-1925 by years and for 1735

1910 by periods, the birth's and the birth rates for 1735–1927 by years and for 1735–1910 by periods have been taken as they were from the official statistics. The mean population for 1926 and 1927 has been computed from the official figures for December 31, 1925–27. The birth rates by periods for 1911–25 have been computed by relating the total births to the sem of the mean populations of all years covered by the period.

Sweden. The official statistics (Statistisk Årsbok för Sverige 1922, pp. 30-32, 1927, pp. 47-48) give the mean population, the births, and the birth rates by years for 1749-1926 and by periods for 1749-1925. The data refer to the territory corresponding to the respective period coinciding uniformly with the present territory.

All data were taken as they were from the official statistics, the birth rates by periods for 1911–25 having been computed by relating the total births to the sum of the mean populations of all years covered by the period.

Switzerland. The official statistics (see Schweizerische Statistik, 112. Lieferung, pp. 7*, 68, 158. Lieferung, pp. 8*-9*, 170. Lieferung, p. 65*; Statistisches Jahrbuch der Schweiz 1909, p. 17; 1926, pp. 46-48; Bulletin des Eidgenoessischen Gesundheitsamtes 1928, p. 111) give the population for the middle of the decades from 1831 to 1870, the mean population by years for 1851-1926 and by quinquennial periods for 1851-1910; the approximate number of births, including still-births, by years and by quinquennial periods for 1836-70, and the live-births by years for 1870-1927 and by quinquennial periods for 1871-1910; the birth rates (including still-births) by years and by quinquennial periods for 1851-70, the live-birth rates by years for 1870-1926 and by quinquennial periods for 1871-1910. The data refer to the territory of the respective years embraced, coinciding throughout the period with the present territory.

The mean population for 1851-1910, and the births and the

birth rates for 1870-1926 were taken as they were from the official statistics, the birth rates by periods for 1911-25 having been computed by relating the total live-births to the sum of the mean populations of all years covered by the period. All other data necessary to include Switzerland in the tables covering Western and Northern Europe had to be arrived at by estimates of our own. The population of Switzerland, according to the census statistics, was 2,190,258 in January/February, 1837, and 2,392,740 on March 18-23, 1850. The Statistical Office of Switzerland has estimated the population for the middle of 1841-50 at 2,320,729. We have here assumed that the mean population in 1841-45 was 2,285,000 and in 1846-50 2,361,000. As to the number of live-births in 1841-69, it has been assumed that they constituted 95 per cent of all births.

Aside from the birth rates of the individual countries, we have given in the text (pages 9-10) birth rates for the whole of Western and Northern Europe. The computation of such birth rates which, as has been explained (pages 14-15), tends to eliminate divergencies occurring in smaller countries, is very easy whenever the combined countries comprise the same territory all the time. Changes in the frontiers of the individual countries can indeed be neglected as long as the boundaries of the aggregate territory of the group do not change. computation of the yearly birth rate of Western and Northern Europe from 1870 to 1914 (see page 10) does not then present any inconvenience. But the problem becomes much more difficult if one attempts to make the computation for the post-war period. The cessions of German territory to Belgium, Denmark, and France may again be neglected, since it would not influence the final result whether those territories appear in the total of Germany or in the total of any other country of the group. But the territories ceded in the East must be accounted for in some way They mast either be added to the group for the post-war period or they must be deducted for all former years. Since these territories belong rather to Eastern Europe than to Western Europe, it was deemed proper to make the necessary deductions for the former years, which is to consider the present eastern frontie's of Germany as the eastern frontiers of Western Europe for the entire period under consideration. It might then seem that it would suffice to add the population and the births of the countries of Western and Northern Europe, as given in the tables pp. 98-101, taking for France and Germany the figures for the present territory. But such a total would not include Eupen and Malmedy for 1911-19, the part of the province of Sleswig ceded to Denmark for 1911-19, nor the Saar Territory for 1911-26. In order to account for this deficiency we have supplemented the figures for 1911-18 according to the method described on page 88. We have further assumed that the population of Eupen and Malmedy, which on December 31, 1920 was 60,213, had been 60,000 in 1919; and that the population of the part of Sleswig ceded to Denmark which on February 1, 1921 was 163,622, had been 163,000 in 1919. As to the birth rates in 1919 we have assumed them to be equal to those for Rhineland and for Sleswig, namely, 20.3 and 18.3 respectively. As to the Saar Territory, we have computed the mean population and have taken the births from Bericht des Statistischen Amtes des Saargebietes, Vol. V, p. 39. All those items have been included in the table on page 9.

YEARLY BIRTH RATE's, 1735-1927 1. 1735-1815

Year	Fin- Land	Nor- way	SWEDEN	Year	Den- mark	Fin- LAND	FRANCE	Nor- way	Sweden
1735 1736 1737 1738 1739 1741 1742 1743 1744 1745 1746 1747 1748 1749 1750 1751 1752 1753 1755 1755 1756 1757 1758 1757 1761 1762 1763 1764 1767 1766 1767 1768 1770 1771 1772 1773 1774 1775	44.3 44.7 44.1 46.9 45.8 41.3 42.5 42.5 41.5 42.9 42.9 42.9 42.9 42.9 42.9 42.9 42.9	29.4 30.7 30.5 28.1 30.9 29.6 27.1 32.8 28.5 33.0 32.9 33.0 35.3 34.5 33.5 34.5 35.8 34.5 35.8 34.5 35.8 34.5 35.8 34.5 35.8 35.1 35.8 35.8 35.1 35.8 35.8 35.8 35.8 35.8 35.8 35.8 35.8	33 8 36.4 33.8 36.1 37.2 37.5 36.1 32.6 33.4 33.6 35.7 34.8 35.7 34.8 35.4 33.6 33.4 33.6 33.4 33.6 33.4 33.6 33.5 35.6	1776 1777 1778 1779 1780 1781 1782 1783 1784 1785 1786 1787 1788 1789 1790 1791 1792 1793 1794 1795 1796 1797 1798 1799 1800 1801 1802 1803 1804 1805 1806 1807 1811 1812 1813 1814 1815		39.0 40.1 42.7 43.2 41.7 40.0 42.7 39.9 40.4 36.1 34.2 37.0 42.2 43.8 41.4 42.1 39.7 41.6 39.7 41.6 39.6 39.6 39.6 39.6 39.6 39.6 39.6 39		28.8 31.3 31.2 30.2 32.5 30.9 27.7 30.5 29.3 30.8 30.7 32.7 34.7 34.7 32.4 31.6 32.3 32.6 27.7 27.6 29.9 29.9 20.9 20.9 20.9 20.9 20.9 20.9	32.9 33.0 34.8 36.7 35.5 32.0 30.3 31.5 31.5 32.6 32.6 32.6 34.7 34.7 34.7 34.7 32.0 31.7 32.0 31.7 32.0 32.0 32.0 32.0 32.0 32.0 32.0 32.0

2. 1816-1854

									
YEAR	Bel-	Den- MARK	Eng- Land And Wales	FINLAND	France	GER- MANY	Hol- LAND	Nor- WAY	Sweden
1816 1817 1818 1819 1820 1821 1822 1823 1824 1825 1826 1827 1828 1830 1831 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1843 1844 1845 1846 1847 1848 1849 1850 1851 1852 1853 1854	33.1 33.5 33.4 33.5 33.4 33.5 34.1 33.6 32.0 27.7 27.2 27.7 30.5 29.8 30.9 28.2 28.9	32.9 32.8 32.1 32.5 31.5 32.1 33.7 32.6 31.3 31.3 31.3 29.6 28.9 29.7 27.0 32.2 33.0 30.5 30.5 30.4 29.7 30.3 30.4 29.7 30.3 30.6 30.6 30.6 30.6 30.6 30.6 30.6		38.8 39.0 38.4 36.1 36.6 41.4 35.6 40.3 37.8 38.7 36.7 39.3 38.7 36.7 39.3 31.1 31.6 37.2 36.3 34.5 37.2 36.3 37.2 36.3 37.2 37.2 37.2 37.2 37.2 37.2 37.2 37	32.9 31.8 30.6 32.9 31.7 31.7 31.2 31.6 31.0 31.4 30.8 30.5 30.9 30.3 28.6 29.5 29.9 28.0 28.5 29.9 28.5 29.5 28.5 27.9 27.7 26.5 27.7 26.6 27.7 27.7	36 6 6 37.5 36.0 37.5 36.0 37.5 36.0 37.5 36.0 37.5 36.0 37.5 36.0 37.5 36.0 37.5 36.0 37.5 36.0 37.5 36.0 37.5 36.0 37.5 36.0 37.5 37.6 37.6 37.6 37.6 37.6 37.6 37.6 37.6	35.1 35.5 34.2 34.4 34.2 34.4 34.7 35.0 32.7 32.4	35.1 32.5 30.8 31.9 32.5 34.8 32.0 31.8 32.0 31.0 32.9 30.7 31.7 32.9 31.7 32.9 31.7 32.9 31.7 32.9 31.7 32.9 31.7 32.9 31.0 32.9 31.0	35.3 33.4 33.0 33.0 35.9 36.8 34.6 36.5 34.9 30.5 30.9 34.1 33.7 31.8 30.8 29.5 31.4 30.3 31.7 30.3 31.5 29.6 30.3 31.5 29.6 31.7 30.7 31.4 33.5
***			<u> </u>	<u> </u>	<u> </u>	'			

3. 1855-1894

SWITZER- LAND	22222222222222222222222222222222222222
SWEDEN	2000 2000 2000 2000 2000 2000 2000 200
Norway	######################################
HOLLAND	######################################
GERMANY	#####################################
FRANCE	83888888888888888888888888888888888888
FINLAND	######################################
IRELAND	1111111112888882828282828383838383838
SCOTLAND	######################################
ENGLAND AND WALLS	88888888888888888888888888888888888888
DENMARK	######################################
Belgius	22222222222222222222222222222222222222
YEAR	1885 1885 1885 1885 1885 1885 1885 1885

4. 1895-1927

SWITZER- LAND	2888 2888 2888 2888 2888 2888 2888 288
Sweden	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Nor- WAY	200 200 200 200 200 200 200 200 200 200
Hot- LAND	23.1 23.1 23.1 23.1 23.1 23.1 23.1 23.1
GER- MANY	38.5 38.5
FRANCE	222.7 222.2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
FINEAND	2222 2222 2222 2222 2222 2222 2222 2222 2222
Ireland (Total)	23.23 23.23
IRESH PREE STATE	2011 2011 2011 2011 2011 2011 2011 2011
Norte- ern Ireland	227.7 22.7 22.7 22.7 22.7 22.7 22.7 22.
Scor- LAND	8888 8888 8888 8888 8888 8888 8888 8888 8888
ENCLAND AND WALES	200 200 200 200 200 200 200 200 200 200
DEN-	23.33 23.23
Весстом	2822 2822 2822 2822 2826 2826 2826 2826
YEAR	1889

MEAN POPULATION BY PERIODS, 1735-1927 (in thousands)

Period	Belgium	Den- mark	FAROE ISLANDS, ICLLAND	ENGLAND AND WALES	SCOT- LAND	IRELAND	ISLANDS IN 1RL BRITISH SLAS	FINLAND
1735 1736-40 1741-45 1746-50 1751-55 1756-60 1751-55 1766-70 1761-65 1761-65 1761-67 1771-75 1776-80 1791-95 1796-1800 1801-05 1806-10 1811-15 1816-20 1821-22 1826-30 1831-33 1836-40 1831-35 1836-40 1841-45 1856-60 1851-55 1856-60 1851-55 1856-70 1851-75 1876-80 1851-95 1871-75 1876-80 1891-95 1896-1900 1901-05 1901-01 1911-14	4,136 4,179 4,136 4,179 4,555 4,524 4,614 4,862 4,614 4,862 5,945 5,935 6,610 6,937 7,5646	925° 943 1,0169 1,136 1,136 1,122 1,269 1,329 1,377 1,475 1,670 1,837 2,033 2,142 2,370 2,5669 2,818 2,971				8.246 7.617 6.230 5.803 5.703 5.469 5.263 5.463 4.614 4.421 4.421 4.327		441 473 510 510 584 632 672 699 732 806 1,034 1,120 1,378 1,499 1,590 1,608 1,708 1,
1920-21	7,528 7,601 7,742 7,843	3,264 3,339 3,407 3,452 3,475	115 118 121 124	37,706 38,281 38,818 39,067 39,290	4,873 4,903 4,888 4,897 4,895	4,291 4,358 4,282 4,253 4,224 4,211	150 151 151 151	3,366 3,436 3,497 3,542

⁽¹⁾ Territory of the respective period.

⁽²⁾ Present territory.

Mean Population by Periods, 1/35-1927 $\stackrel{\uparrow}{/}$ (in thousands)

France France (1) (2)	Ger- Ger Many Many (1) (2)	HOLLAND	LUXEM- BURG	Norway	Sweden	SWITZER- LAND
29,186 29,354 29,874 30,938 32,010 32,904 33,808 34,680 35,714 36,661 36,368 37,205 37,205 37,205 38,294 36,364 37,910 37,156 38,709 37,156 38,709 38,306 39,420 39,550 39,420 39,550 39,560 40,460 40,790 40,960	32,097 29,471 33,356 30,533 34,377 31,538 35,331 32,417 37,193 34,091 38,683 35,462 41,641 36,805 44,104 39,067 44,104 39,067 44,019 40,971 48,176 42,929 50,827 45,514 52,823 56,680 62,853 56,680 66,535 56,001 61,516 62,251 62,851	2,9722 3,078 3,175 3,273 3,578 3,175 3,282 3,570 3,702 3,949 4,466 4,702 5,037 5,037 6,106 6,537 1,7,313 7,472 7,576		607 621 607 618 637 670 701 735 771 778 823 8639 8639 1,013 1,023 1,163 1,223 1,233 1,223 1,242 1,549 1,771 1,876 1,977 2,043 2,478	1,766° 1,828 1,896 1,896 1,896 2,018 2,018 2,018 2,218 2,238 2,328 2,328 2,328 2,425 2,530 2,834 2,945 3,083 3,224 3,558 3,224 4,500 4,605 4,742 4,803 5,244 5,601 5,700 5,903 6,004	2,285 2,361 2,429 2,519 2,519 2,519 2,613 2,715 2,874 2,920 3,039 3,226 3,429

a 1749-50 only

b 1796-99 only

^{¢ 1800} only.

d 1838-40 only.

.100 THE BALANCE OF BIRTIIS AND DEATHS

A TRAGE YEARLY BIRTHS BY PERIODS, 1735-1927

⁽¹⁾ Territory of the respective period. (2) Present territory.

Average Yearly Births by Periods, 1735-/927

FRANCE FRANCE (1) (2)	GERMANY GERMANY (1) (2)	Holland	Luxen- Burg	Nor- way	Sweden	SWIT- ZER- LAND
923,865 930,730 955,108 971,798 976,564 974,956 979,959 970,831 970,383 998,760 998,760 998,760 998,760 998,760 998,760 998,760 934,577 933,833 822,664 930,120 848,710 899,696 830,977 831,335 833,435 783,132 87,291 87,291 87,291 88,791 89,500 848,710 89,500 848,710 89,600 848,710 89,600 810,977 83,633 833,435 783,132 87,291 87,313 87,291 87,313 87,291 87,313 87,291 87,313 87,413	1,181,971 1,068,547 1,195,500 1,081,183 1,198,120 1,082,573 1,281,820 1,158,212 1,377,831 1,224,461 1,30,437 1,525,537 1,704,741 1,508,534 1,344,068 1,642,502 1,956,523 1,743,145 2,010,625 1,795,206 1,988,104 1,776,746 1,988,104 1,988,104 1,776,746 1,988,104 1,776,746 1,988,104 1,776,746 1,988,104 1,988,104 1,988,104 1,988,104 1,988,104 1,988,104 1,988,104 1,988,104 1,988,104 1,988,104 1,988,104 1,988,1			17,850 18,607 17,580 19,474 21,940 22,968 24,733 24,171 21,594 22,3125 23,226 24,283 27,594 25,046 21,250 36,273 34,131 34,131 34,131 34,131 34,131 35,980 36,273 34,273 34,131 35,980 36,273 36,173 36,181 51,562 51,562 61,635 6	61,997a 67,808 65,035 67,537 67,930 63,257 71,594 67,938 70,024 75,817 76,248 74,646 95,706 95,706 94,946 95,360 91,310 125,65 123,658 131,033 136,427 135,206 135,256 123,658 131,033 136,434 132,575 135,206 137,483 131,376 119,736 119,736	

^{# 1749-50} only b 1796-99 only. c 1800 only. d 1838-40 only.

APPENDIX B

WOMEN OF CHILD-BEARING AGE

THERE are no definite limits to the child-bearing age. But in Western and Northern Europe births of a mother under 15 years or over 50 years practically never occur. The As to the relative limits, statisticians agree that women over 15 years only are to be considered as of child-bearing age, but the upper limit is flexible. Some draw the limit at 45 years while others put it at 50 years. The actual facts are not conclusive since the number of births for women from 45 to 50 years, while small, is not negligible. Theoretically, it is certainly more correct to relate the births to the women of 15-50 years. But since the women of 45-50 years do not much influence the total number of births, yet may considerably affect the number of women to which the number of births is related, their inclusion can have an undue effect upon the general fertility rate. On the other hand, some countries do not publish separately the number of women of 40-45 and 45-50 years, and this

¹ We venture this statement in spite of the fact that the statistics of some countries show a rather large number of mothers over 50 years. For 1901–05 the number of such mothers is given as being 5 in Denmark, 38 in Sweden, 157 in Finland, 238 in Norway, and 3,671 in Finance. (See Statistique Internationale du Mouvement de la Population, Vol. II, pp. 107–112) The differences between the figures of Denmark and Norway are such that they cannot possibly represent the actual conditions. As to France, the number of such births dropped from 1,027 in 1906 to 64 in 1907 and stayed on the lower level up to the present time; the early figures, then, certainly were not accurate.

technical factor made us finally choose 50 years is the upper limit of child-bearing age.

The table on pages 106-110 gives the total population, the women of child-bearing age, and the percentage of such women in every country of Western and Northern Europe for which adequate official data are available.² In case of choice, preference has been given to dates ending a quinquennial period. As to the sources from which the data were taken, the following may be said:

Belgium. 1846–1866, data taken from Recensement Général du 31 Décembre 1890, Vol. I, pp. LI, LIII; 1880–1900, from Recensement Général du 31 Décembre 1920, Vol. I, pp. 74–75, 1911 and 1921, from Annuaire Statistique de la Belgique et du Congo Belge 1924–1925, pp. XXIV–XXV.

Denmark. 1840, 1845, 1855, 1860, 1890, 1901, data taken from Statistisk Tabelværk, Fifth Series, Letter A, No. 5, p. 55; 1850, from Statistique Internationale du Mouvement de la Population, Vol. I, p. 192; 1870 and 1880, from Statistik des Deutschen Reichs, Vol. 44, p. 110; 1911 and 1921, from Statistisk Aarbog 1927, pp. 10-11

England and Wales. 1851-1921, data taken from Census of England & Wales 1921, General Tables, p. 142; 1922-25, from The Registrar-General's Statistical Review of England and Wales for the Year 1922, Text, p. 111; 1923, Text, p. 112; 1924, Text, p. 115; 1925, Text, p. 113.

Scotland. 1851 and 1861, data taken from Census of Scotland 1861, Vol. II, p. XVI; 1871-1921, from Report of the Thirteenth Decennial Census of Scotland, Vol. II, p. 167.

Ireland. 1861, data taken from The Census of Ireland for the Year 1861, Part II, Vol. I, p. 6; 1871 from Statistique Internationale du Mouvement de la Population, Vol. I, p. 192; 1881

² No data are given here for Faroe Islands, Iceland, the Islands in the British Seas, Luxemburg, and the Saar Territory.

and 1891, from Census of Ireland 1391, Part II, p. 330; 1901 and 1911, from Census of Ireland 1911, General Report, with Tables and Appendix, p. 74.

Finland. 1751-1890, data taken from Éléments Démographiques Principaux de la Finlande pour les Années 1750-1890, Vol. I, pp. 59-61°; 1900, from Aperçu de la Population de la Finlande au 31 Décembre 1900 et Données tirées des Recensements Généraux Précédents, Tables, p. 16; 1910, from Annuaire Statistique de Finlande 1919, p. 40; 1920, from Annuaire Statistique de Finlande 1927, p. 39.

France. 1851 and 1861, data taken from Statistique Internationale du Mouvement de la Population, Vol. I, p. 195; 1872-81, from Statistik des Deutschen Reichs, Vol. 44, p. 107; 1891, from Résultats du Dénombrement de 1891, pp. 190-191; 1896, from Résultats Statistiques du Dénombrement de 1896, p. 202; 1901, from Résultats Statistiques du Recensement Général de la Population effectué le 24 mars 1901, Vol. IV, p. 38; 1906, from idem, le 4 mars 1906, Vol. I, Part II, p. 27; 1911, from idem, le 5 mars 1911, Vol. I, Part II, p. 33; 1921, from idem, le 6 mars 1921, Vol. I, Part II, p. 19.

Germany. 1871, 1875, and 1880, data taken from Statistik des Deutschen Reichs, Vol. 44, p. 75; 1890, from ibid., Vol. 68, p. 31*; 1900, from ibid., Vol. 150, p. 85*; 1910 and 1925, from Statistik des Deutschen Reichs, Vol. 240, p. 80*, Wirtschaft und Statistik 1928, p. 118; 1919, from Aperçu de la Démographie des Divers Pays du Monde 1925, p. 64.

Holland. All data taken from Jaarcijfers voor Nederland 1927, p. 9.

Norway. 1801-65, data taken from Statistique Internationale d'u Mouvement de la Population, Vol. I, p. 192; 1875, from Statistik des Deutschen Reichs, Vol. 44, p. 111; 1891-1920, from Norges Officielle Statistik, Third Series, No. 229, pp. 107, 174-193, Sixth Series, No. 8, p. 111, Statistisk Årbog 1904, p. 7, 1927, p. 8.

Sweden. 1750–1900, da a taken from Statistisk Tidskrift 1906, pp. 173, 227–229; 1910, from Statistisk Årsbok för Sverige 1914, pp. 10-11; 1915, from Befölkningsrorclsen 1915, p. 22; 1920 and 1922, from Statistisk Årsbok for Sverige 1927, pp. 10-11.

Switzerland. 1860-88, data taken from Résultats Statistiques du Recensement Fédéral du 1 Décembre 1900, Vol. II, p. 346; 1901-21, from idem, 1 Décembre 1920, Premier Fascicule, pp. 50-51.

In some cases where the census was not taken at the end of the year the age data refer to calendar years of birth.

The women whose age was not reported at the census have been proportionally assigned to the different age groups.

All data refer to the territory of the time specified, but those for Belgium, 1920, do not include Eupen and Malmedy. For Germany, 1910, data are given also for the present territory.

In giving combined results for Western and Northern Europe, data had to be assembled which do not all refer to the same date:

1860. The data for Denmark, Great Britain, Ireland, France, Holland, Sweden, and Switzerland are taken from censuses between December 31, 1859, and June 1861.

For Belgium, the total population of December 31, 1860, has been taken from Annuaire Statistique de la Belgique et du Congo Belge 1924-25, p. 37 (4,731,996); the women of childbearing age, being 25.36 per cent on December 31, 1856, and 24.44 per cent on December 31, 1866, have been assumed to have constituted 24.99 per cent on December 31, 1860 (1,182,526).

For Finland, the total population of December 31, 1860, has been taken from *Éléments Démographiques* Vol. I, p. 2 (1,746,725); the women of child-bearing age being 25.47 per cent on December 31, 1850, and 25.62 per cent on December

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(Women of Child-Bearing Age, 1750-1925

	TOMEN OF		AGE, 1750-1925	
Dati	3	TOTAL POPULATION	Womln 15-50 Years	PER CENT
		Belgium		
Oct. 15, 1846 Dec. 31, 1856 Dec. 31, 1866 Dec. 31, 1880 Dec. 31, 1890 Dec. 31, 1900 Dec. 31, 1910 Dec. 31, 1920		4,337,196 4,529,560 4,827,833 5,520,009 6,069,321 6,693,548 7,423,784 7,406,299	1,091,271 1,148,476 1,180,024 1,322,002 1,486,375 1,696,508 1,919,636 2,056,435	25 16 25,36 24,44 23,95 24 49 25,35 25 86 27,77
		Denmark		
Feb. 1, 1840 Feb. 1, 1845 Feb. 1, 1850 Feb. 1, 1860 Feb. 1, 1870 Feb. 1, 1880 Feb. 1, 1890 Feb. 1, 1901 Feb. 1, 1911 Feb. 1, 1921		1,283,027 1,350,327 1,407,747 1,409,850 1,600,551 1,784,741 1,969,039 2,172,380 2,449,540 2,757,076 3,267,831	331,220 348,692 363,886 380,957 402,304 445,579 481,792 527,806 610,179 689,816 848,626	25.82 25.82 25.85 25.40 25.14 24.97 24.47 24.30 24.91 25.02 25.02
		England and Wa	eles	
Mar. 31, 1851 April 8, 1861 April 3, 1871 April 4, 1881 April 5, 1891 Mar. 31, 1901 April 2, 1911 June 19, 1921 Mid-year 1922 Mid-year 1923 Mid-year 1924 Mid-year 1925		17,927,609 20,066,224 22,712,266 25,974,439 29,002,525 32,527,843 36,070,492 37,886,699 38,158,000 38,403,000 38,746,000 38,746,000	4,640,866 5,198,821 5,785,849 6,593,480 7,585,835 8,934,080 9,988,232 10,712,239 10,768,923 10,825,094 10,923,152 10,964,801	25.89 25.91 25.47 25.38 26.16 27.47 27.69 28.27 28.22 28.19 28.19

Women of Child-Bearing Age, 1750-1925 (Continued)

DATE	 TOTAL POPULATION	Women 15-50 Years	PER CENT
	Scotland		
Mar. 31, 1851 April 8, 1861 April 3, 1871 April 4, 1881 April 5, 1891 Mar. 31, 1901 April 2, 1911 June 19, 1921	2,888,742 3,062,294 3,360,018 3,735,573 4,025,647 4,472,103 4,760,904 4,882,497	774,019 810,303 861,623 950,507 1,035,347 1,190,821 1,271,616 1,336,724	26.79 26.46 25.64 25.44 25.72 26.63 26.71 27.38
	Ireland		
April 8, 1861 April 3, 1871 April 4, 1881 April 5, 1891 Mar. 31, 1901 April 2, 1911	 5,798,967 5,412,377 5,174,836 4,704,750 4,458,775 4,390,219	1,492,135 1,292,465 1,265,391 1,174,420 1,147,625 1,079,780	25.73 23.88 24.45 24.96 25.74 24.60
	Finland		
Dec. 31, 1751 Dec. 31, 1775 Dec. 31, 1800 Dec. 31, 1825 Dec. 31, 1855 Dec. 31, 1870 Pec. 31, 1875 Dec. 31, 1875 Dec. 31, 1885 Dec. 31, 1885 Dec. 31, 1885 Dec. 31, 1890 Dec. 31, 1900 Dec. 31, 1910 Dec. 31, 1920	429,912 610,145 832,659 1,259,151 1,636,915 1,843,245 1,768,769 1,912,647 2,060,782 2,208,518 2,380,140 2,712,562 3,115,197 3,364,807	103,196 154,006 216,689 330,422 416,902 472,155 470,483 493,856 522,886 544,244 581,561 664,682 761,217 871,995	24.00 25.24 26.02 26.24 25.47 25.62 26.60 25.82 25.37 24.64 24.43 24.50 24.44 25.92

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Women of Child-Bearing Age, 1750-1925 (Continued)

DATE			Total Population	WOMEN 15-50 YEARS	PER CENT		
			France				
April-May, 1851 May-June, 1861 April-May, 1872 Dec. 1876 Dec. 18, 1881 April 12, 1891 Mar. 29, 1896 Mar. 24, 1901 Mar. 4, 1906 Mar. 5, 1911 Mar. 6, 1921	:		35,783,170 37,386,313 36,102,921 36,905,788 37,672,048 38,133,385 38,269,011 38,450,788 38,844,653 39,192,133 38,797,540	9,368,995 9,715,799 9,260,278 9,401,041 9,543,821 9,779,592 9,892,124 9,892,576 10,024,962 10,138,099 10,703,875	26.18 25.99 25.65 25.47 25.33 25.65 25.73 25.81 25.81 25.87 27.59		
			Germany				
Dec. 31, 1871 Dec. 31, 1875 Dec. 31, 1880 Dec. 1, 1890 Dec. 1, 1900 Dec. 1, 1910 Dec. 1, 1910 Oct. 8, 1919 June 16, 1925			41,028,150 42,775,234 45,284,526 49,428,470 56,367,178 64,925,993 57,798,427 60,412,084 62,410,619	10,430,622 10,718,342 11,232,909 12,342,063 14,111,007 16,436,991 14,719,865 17,417,543 18,095,155	25.42 25.06 24.81 24.97 25.03 25.32 25.47 28.83 28.99		
	Holland						
Nov. 19, 1849 Dec. 31, 1859 Dec. 1, 1869 Dec. 31, 1879 Dec. 31, 1889 Dec. 31, 1899 Dec. 31, 1909 Dec. 31, 1920			3,056,879 3,309,128 3,579,529 4,012,693 4,511,415 5,104,137 5,858,175 6,865,314	789,441 863,332 903,758 964,318 1,078,361 1,246,487 1,453,752 1,749,988	25.83 26.09 25.25 24.03 23.90 24.42 24.82 25.49		

¹ Present territory.

Women of Child-Bearing Age, 1750-1925 (Continued)

	 1	,	
DATE	TOTAL POPULATION	Women 15-50 Years	PER CENT
	 ·		
	Norway		
Feb. 1, 1801 Nov. 27, 1825 Nov. 29, 1835 Dec. 31, 1845 Dec. 31, 1855 Dec. 31, 1865 Dec. 31, 1875 Jan. 1, 1891 Jan. 1, 1901 Dec. 1, 1910 Dec. 1, 1920	883,440 1,051,318 1,194,827 1,328,471 1,490,047 1,701,756 1,818,853 1,988,674 2,242,995 2,357,790 2,649,775	227,452 262,314 289,271 338,773 368,473 420,897 451,743 486,060 546,001 580,994 669,240	25.75 24.95 24.21 25.50 24.73 24.84 24.84 24.34 24.64 25.26
	Sweden		
Dec. 31, 1750 Dec. 31, 1755 Dec. 31, 1765 Dec. 31, 1765 Dec. 31, 1765 Dec. 31, 1775 Dec. 31, 1780 Dec. 31, 1785 Dec. 31, 1785 Dec. 31, 1800 Dec. 31, 1805 Dec. 31, 1805 Dec. 31, 1810 Dec. 31, 1810 Dec. 31, 1820 Dec. 31, 1820 Dec. 31, 1830 Dec. 31, 1830 Dec. 31, 1845 Dec. 31, 1845 Dec. 31, 1850	1,780,678 1,875,029 1,925,248 1,976,824 2,042,574 2,020,847 2,118,281 2,149,773 2,187,732 2,281,137 2,347,303 2,422,039 2,396,351 2,465,066 2,584,690 2,771,252 2,888,082 3,025,439 3,138,887 3,316,536 3,482,541 3,859,728	461,779 478,384 495,483 513,733 539,105 543,638 559,218 571,247 577,273 600,162 615,184 628,302 639,660 656,525 676,672 698,151 719,911 756,476 815,816 860,420 907,360 945,516 1,003,955	25.93 25.51 25.74 25.99 26.39 26.40 26.57 26.31 26.21 25.94 26.63 26.18 25.19 24.93 25.00 25.99 25.99 25.99 26.05

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Women of Child-Bearing Age, 1750-1925 (Continued)

Date	 TOTAL POPULATION	Women 15-50 Years	PER CLN
	Sweden (continu	$\iota ed)$	
Dec. 31, 1865 Dec. 31, 1870 Dec. 31, 1875 Dec. 31, 1880 Dec. 31, 1885 Dec. 31, 1890 Dec. 31, 1900 Dec. 31, 1910 Dec. 31, 1915 Dec. 31, 1920 Dec. 31, 1920 Dec. 31, 1922	4,114,141 4,168,525 4,383,291 4,565,668 4,682,769 4,784,981 4,919,260 5,136,441 5,522,403 5,712,740 5,904,489 5,987,520	1,052,096 1,060,464 1,095,837 1,144,191 1,144,680 1,150,081 1,176,251 1,235,940 1,338,700 1,399,300 1,488,863 1,525,581	25.57 25.44 25.00 25.06 24.44 24.04 23.91 24.06 24.24 24.49 25.22 25.48
	Switzerland		
Dec. 10, 1860 Dec. 1, 1870 Dec. 1, 1880 Dec. 1, 1888 Jan. 1, 1901 Jan. 1, 1911 Jan. 1, 1921	2,510,494 2,669,147 2,846,102 2,917,754 3,317,741 3,755,740 3,881,873	675,313 697,348 727,287 743,455 856,064 977,311 1,076,200	26.90 26.13 25.55 25.48 25.80 26.02 27.72

31, 1865, have been assumed to have constituted 25.57 per cent on December 31, 1860 (446,638).

For Germany, the mean population of 1860 has been taken from Statistik des Deutschen Reichs, Vol. 44, pp. 2, 48 (36,048,700). The percentage of women of child-bearing age being 26.22 in Saxony and Wurttemberg combined on December 3, 1861, (computed from Statistisches Jahrbuch fuer den Freistaat Sachsen 1924–1926, p. 10, and Statistique Internationale du Mouvement de la Population, Vol. I, p. 194) and 25.79 on December 31, 1871,

(computed from Statistik, Vol. 44, pp. 86-87) while that in Germany (excluding Alsace-Lorraine) was 25.45 on December 31, 1871, (computed from Statistik, Vol. 44, pp. 75, 102), it has been assumed that the percentage for Germany in 1860 has been 25.88 (9,329,404).

For Norway, the population of July 1, 1860, has been taken from *Statistiske Oversikter 1926*, p. 7 (1,596,089); the women of child-bearing age, being 24.73 per cent both on December 31, 1855, and 1865, have been assumed to have constituted the same percentage in 1860 (394,713).

1870. The data for all countries except Belgium and Norway were taken from censuses between December 1, 1869, and May 1872. For Belgium the total population of December 31, 1870, has been taken from Annuaire Statistique de la Belgique et du Congo Belge 1924-25, p. 37 (5,087,826); the women of child-bearing age being 24.44 per cent on December 31, 1866, and 23.95 on December 31, 1880, have been assumed to have constituted 24.30 per cent on December 1, 1870 (1,236,342). For Norway the population of July 1, 1870 has been taken from Statistiske Oversihter 1926, p. 8 (1,735,425); the women of child-bearing age being 24.73 per cent on December 31, 1865, and 24.84 per cent on December 31, 1875, have been assumed to have constituted 24.78 per cent on July 1, 1870 (430,038).

1880. The data for all countries except Norway were taken from censuses between December 31, 1879, and December 18, 1881. For Norway the population of July 1, 1880, has been taken from *Statistiske Oversikter 1926*, p. 8 (1,919,075); the women of child-bearing age being 24.84 per cent on December 31, 1875 and 24.44 per cent on January 1, 1891, have been assumed to have constituted 24.72 per cent on July 1, 1880 (474,395).

1890, 1900, 1910. The data for all countries were taken

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from censuses between December 1, 1888, and April 12, 1891; December 31, 1899, and March 31, 1901; December 31, 1909, and April 2, 1911.

1920. The data for all countries except Ireland were taken from censuses between October 8, 1919, and June 19, 1921. For Ireland the mid-year population of 1920 has been taken from The Registrar-General's Statistical Review of England and Wales for the Year 1926, Tables, Part II, Civil, p. 3 (4,361,000); the women of child-bearing age have been assumed to constitute 25 per cent.

APPENDIX C

AGE OF MOTHERS

The tables on pages 122-28 give the female population and the births (or confinements) by quinquennial age groups from 15 to 50 years in every country of Western and Northern Europe for which adequate official data on the age of the confined are available. Births of mothers under 15 years were included in the age group 15 to 20 years, births of mothers over 50 years in the age group 45 to 50 years. The women whose age was not reported have in both tables been proportionally assigned to the different age groups. So far as census data were used, the sources were identical with those quoted in Appendix B.

Denmark. The average number of females in 1878-84 has been estimated on the basis of the census data of February 1, 1880. The figures for 1885-94, 1895-1900, 1901-05, and 1906-10 have been computed on the basis of the numbers of confinements and deaths, confinement rates, and death rates published in Statistisk Tabelværk, Fourth Series, Letter A, No. 7, p. XII, No. 9, pp. 17*, 228, Fifth Series, Letter A, No. 2, p. 12*, No. 5, pp. 124-25, No. 6, pp. 19*, 25*, No. 8, pp. 22*, 29*; Statistik des Deutschen Reichs, Vol. 246, p. 19*. The figures for 1911-15 and 1916-20 have been taken from Statistisk Tabelværk, Fifth Series, Letter A, No. 16, p. 24*. The figures for 1921-25 and 1926 have been estimated. For confinements 1878-79 see Statistisk Tabelværk, Fourth Series, Letter A, No. 2, p. IX, and

¹ No data are given here for the Faroe Islands, Iceland, Luxemburg.

Statistik des Deutschen Reichs, Vol. 44, p. 143, 1880-84 Statistisk Tabelværk, Fourth Series, Letter A, No. 5, p. XI, 1885-89 Fourth Series, Letter A, No. 7, p. XII, 1890-94 Fourth Series, Letter A, No. 9, p. 228, 1895-1900 Fifth Series, Letter A, No. 2, p. 12*, 1901-05 Fifth Series, Letter A, No. 6, p. 19*, 1906-10 Fifth Series, Letter A, No. 13, p. 36*, 1916-20 Fifth Series, Letter A, No. 15, p. 42*, 1921-26 Aperçu de la Démographie des Divers Pays du Monde 1927, p. 169. For female live-born 1878-1926 see Statistisk Tabelværk, Fourth Series, Letter A, No. 2, p. 215, No. 5, p. 43, No. 7, p. 45, No. 9, p. 169, Fifth Series, Letter A, No. 2, p. 13*, No. 6, p. 69, No. 8, p. 69; Statistisk Aarbog 1918, p. 20, 1927, pp. 22-23; Aperçu 1927, p. 116.

England and Wales. The age of the mother is not recorded in England, but there are some official data which permit to make an estimate of the age distribution in 1921. The Registrar-General (see The Registrar-General's Statistical Review of England and Wales for the Year 1925, Text, p. 133) has indeed derived from the census data of 1921 fertility rates of married and unmarried women by quinquennial age groups (see table p. 115, cols. 3 and 4). By multiplying those rates by the female population as found at the census (cols. 1 and 2) we arrive at a total of 810,359 legitimate and 38,615 illegitimate births (cols. 5 and 6). Since the actual numbers were 810.196 legitimate and 38,618 illegitimate births the figures had only slightly to be corrected; at the same time it has been assumed that 1/300 of the mothers of live-born were over 45 years of age (cols. 7 and 8). In order to arrive at a further estimate of the age distribution of the mothers for 1925, it was necessary to first ascertain the fertility rates by quinquennial age groups for 1921 (col. 11) by dividing the births of 1921 (col. 9) by the women living in 1921 (col. 10). Those fertility rates have then been multiplied by the number of women living in mid-year 1925 (col. 12) as given

in the Registrar-General's Report (see *ibid.* p. 113). The products thus found (col. 13) indicate the number of births that would have occurred in 1925, if the fertility rates in that year hall-been the same as in 1921. Their total is 865,916; but the artual number of births in 1925 was only 710,582.

BIRTHS AND FERTILITY RATES IN ENGLAND

	Married	Unmarried	Fertilii	Y RATES	Computed Births		
YEARS OF AGE	Women 1921 (1)	Women 1921 (2)	Married Women 1921 (3)	Unmarried Women 1921 (4)	Legitimate 1921 (5)	Illegitimate 1921 (6)	
15-20 20-25 25-30 30-35 35-40 40-45 45-50	31,145 459,789 920,986 1,059,538 1,089,287 1,035,109 919,123	1,744,086 1,243,278 699,304 460,111 382,626 343,012 324,845	447 359 268 197 131 32	7.65 15 14 8 71 0.78	13,922 165,064 246,824 208,729 142,697 33,123	13,342 18,823 6,091 359	
Total	5,514,977	5,197,262	_	_	810,359	38,615	

		ectld Nu			Fertil-		BIRTHS 1925 WITH
YLARS OI AGE	Legiti- mate	Illegiti- mate 1921	Total 1921	Wомен 1921	RAIDS' 1921	Women 1925	FERTIL- ITY or 1921
	1921 (7)	(8)	(9)	(10)	(11)	(12)	(13)
15-20 20-25 25-30 30-35 35-40 40-45- 45-50	13,919 165,031 246,774 208,687 142,668 30,288 2,829	13,343 18,825 6,091 359 —	27,262 183,856 252,865 209,046 142,668 30,288 2,829	1,775,231 1,703,067 1,620,290 1,519,649 1,471,913 1,378,121 1,243,968	15.36 107.96 156.09 137.53 96 92 21 98 2.27	1,802,695 1,727,504 1,654,285 1,585,213 1,452,821 1,443,897 1,298,386	27,684 186,502 258,217 218,015 140,809 31,736 2,953
Total	810,196	38,618	848,814	10,712,239	- ^	10,964,801	865,916

The female live-born were taken from The Registrar-General's Statistical Review of England and Wales for the Year 1926, Tables, Part II, Civil, p. 4.

Finland. For average number of females and for confinements by quinquennial periods from 1866 to 1890 see Éléments Démographiques Principaux de la Finlande pour les Années 1750-1890, Vol. I, pp. 148-150, Vol. II, p. 102. The figures for 1891-1900 have been computed from the confinement rates published in Mouvement de la Population de Finlande en 1919 et 1920, p. 26. The figures for 1901-10 and 1911-20 have been taken from Tables de Mortalité et de Survie pour les Années 2001-1010 et 1011-1020, Tableaux, p. 3. The number of confinements for the years 1891-1920 have been taken from Mouvement de la Population de Finlande en 1891, p. 14, 1892, p. 13, 1893, p. 15, 1894, p. 16, 1895, p. 16, 1896, p. 16, 1897, p. 16, 1898, p. 16, 1899, p. 16, 1900, p. 53, 1901 et 1902, p. 24, 1903 et 1904, p. 24, 1905 et 1906, p. 24, 1907 et 1908, p. 26, 1909 et 1910, p. 35, 1911 et 1012, pp. 32-33, 1913 et 1914, p. 33, 1915 et 1916, p. 32, 1917 et 1918, p. 27, 1919 et 1920, p. 23, those for the years 1921-25 from Aperçu de la Démographie des Divers Pays du Monde 1027. p. 169. The female live-born for 1866-90 have been taken from Éléments Démographiques Principaux de la Finlande pour les Années 1750-1890, Vol. II, p. 150, for 1891-1910 from Statistique Internationale du Mouvement de la Population, Vol. I. p. 320, Vol. II, p. 97, for 1911-13 from Annuaire International de Statistique, Vol. II, 1917, p. 38, for 1914-25 from Annuaire Statistique de Finlande 1927, p. 60.

France. The average number of females in 1892–97 has been estimated on the basis of the census data of 1891 and 1896. The average number of females in 1898–1903 has been assumed to be equal to that of January 1, 1901, given in Résultats Statistiques du Recensement Général de la Population effectué le 24 mars 1901, Vol. IV, pp. 58–59. As semales in 1904–07 have

been entered the females at the census of March 4, 1906, as females in 1908-13 the females at the census of March 5, 1911. The average number of females in 1914-19 (for the 77 unoccupied provinces) has been taken from Statistique du Mouvement de la Population, New Series, Vol. III, p. lxvi. The average number of females in 1920-21 has been assumed to be equal to that of the census of March 6, 1921. The females in 1922-25 have been estimated. The births and the female live-born in 1892-1925 have been taken from Statistique Internationale du Mouvement de la Population, Vol. I, pp. 338, 365, Vol. II, pp. 100, 113, Annuaire International de Statistique, Vol. II, 1917, pp. 46, 66, Statistique du Mouvement de la Population, New Series, Vol. III, pp. lxvi, 20-25, Aperçu de la Démographie des Divers Pays du Monde 1925, p. 257, 1927, pp. 116, 171.

Germany. The average numbers of females and the births in nine German States (Hesse, Oldenburg, Brunswick, Saxony-Weimar, Saxony-Altenburg, the Schwarzburg and Reuss principalities) for 1881-1910 have been taken from Statistik des Deutschen Reichs, Vol. 246, p. 9*. The average number of females in Saxony for 1911-24 has been estimated on the basis of the population data for January 1, 1911, October 8, 1919, and June 16, 1925, published in Statistik des Deutschen Reichs, Vol. 240, Part II, pp. 242-247, Aperçu de la Démographie des Divers Pays du Monde 1925, p. 68, idem 1927, p. 70, and of the number of women of 15 to 50 years given for each mid-year (from 1833 on) in Statistisches Jahrbuch fuer den Freistaat Sachsen, 1921-23, p. 17, 1924-26, p. 10; the number of liveand still-births and of female live-born have been taken from Statistisches Jahrbuch fuer den Freistaat Sachsen 1913, p. 34, 1914-15, p. 30, 1916-17, p. 26, 1918-20, p. 47, 1921-23, pp. 23, 46, 1924-26, pp. 61, 85, Zeitschrift des Saechsischen Statistischen Landesamts 1918 und 1919, pp. 36-39, 1923, pp. 32-35.

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BIRTUS AND FERTILITY RATES IN GLRMANY

Years of Age					- _
15-20 . 2,268,196	YEARS OF	WOMEN RATES GERMANY 9 STATE	BIRTHS GERMANY	Births Glrmany	ESTIMATED TY KATES GERMANN (5)
20-25 . 2,062,456 177.218 365,504 389,297 25-30 . 1,799,457 277.554 499,447 531,958 30-35 . 1,654,228 238 315 394,227 419,890 35-40 . 1,461,948 182 160 266,309 238,644 40-45 . 1,354,596 80 211 108,654 115,726 45-50 . 1,182,848 10.224 12,093 12,881 Total . 11,783,729 984.467 1,688,842 1,798,778 5 **R8g1-1g00** 15-20 . 2,531,720 20.659 52,303 55,011 20-25 . 2,356,037 182,724 430,504 452,796 25-30 . 2,073,230 275 634 571,453 601,044 30-35 . 1,857,672 231,389 429,845 452,103 35-40 . 1,616,458 166 481 269,109 283,045 40-45 . 1,485,317 69 670 103,482 108,840 40-45 . 1,485,317 69 670 103,482 108,840 45-50 . 1,306,101 8 203 10,714 11,269 Total . 13,226,535 954.760 1,867,410 1,964,108 5 **Igor-Igio** **Igor-Igio** **Igor-Igio** **Igor-Igio** 15-20 . 2,895,545 23.282 67,414 70,419 20-25 . 2,680,912 176.046 471,964 492,999 25-30 . 2,380,343 260,776 620,736 648,401 30-35 . 2,203,188 198.457 437,238 456,725		188	31 – 1890		
18g1-1g00 15-20 2,531,720 20,659 52,303 55,011 20-25 2,356,037 182,724 430,504 452,796 25-30 2,073,230 275,634 571,453 601,044 30-35 1,857,672 231,389 429,845 452,103 35-40 1,616,458 166,481 269,109 283,045 40-45 1,485,317 69,670 103,482 108,840 45-50 1,306,101 8,203 10,714 11,269 Total 13,226,535 954.760 1,867,410 1,964,108 5 1901-1910 15-20 2,895,545 23,282 67,414 70,419 20-25 2,680,912 176,046 471,964 492,999 25-30 2,380,343 260,776 620,736 648,401 30-35 2,203,188 198,457 437,238 456,725	20-25 25-30 30-35 35-40 40-45	2,062,456 177.21 1,799,457 277.55 1,654,228 238 31 1,461,948 182 10 1,354,596 80 21	48 365,504 54 499,447 15 394,227 30 266,309 11 108,654	389,297 531,958 419,890 238,644 115,726	20.0 188 8 295 6 253 6 194 0 85.5 10 9
15-20 . 2,531,720 20.659 52,303 55,011 20-25 . 2,356,037 182,724 430,504 452,796 25-30 . 2,073,230 275 634 571,453 601,044 30-35 . 1,857,672 231.389 429,845 452,103 35-40 . 1,616,458 166 481 269,109 283,045 40-45 . 1,485,317 69 670 103,482 108,840 45-50 . 1,306,101 8 203 10,714 11,269 Total . 13,226,535 954.760 1,867,410 1,964,108 5 15-20 . 2,895,545 23.282 67,414 70,419 20-25 . 2,680,912 176.046 471,964 492,999 25-30 . 2,380,343 260,776 620,736 648,401 30-35 . 2,203,188 198,457 437,238 456,725	Total	11,783,729 984.40	1,688,842	1,798,778	5,242.8
20-25 2,356,037 182,724 430,504 452,796 25-30 2,073,230 275 634 571,453 601,044 30-35 1,857,672 231,389 429,845 452,103 35-40		189	n-1900		
15-20 . 2,895,545 23.282 67,414 70,419 20-25 . 2,680,912 176.046 471,964 492,999 25-30 . 2,380,343 260,776 620,736 648,401 30-35 . 2,203,188 198.457 437,238 456,725	20-25 25-30 30-35 35-40 40-45	2,356,037 182,72 2,073,230 275 63 1,857,672 231,38 1,616,458 166 48 1,485,317 69 67	24 430,504 34 571,453 39 429,845 31 269,109 70 103,482	452,796 601,044 452,103 283,045 108,840	21.7 192.2 289.9 243.4 175.1 73.3 8.6
15-20 . 2,895,545 23.282 67,414 70,419 20-25 . 2,680,912 176,046 471,964 492,999 25-30 . 2,380,343 260,776 620,736 648,401 30-35 . 2,203,188 198.457 437,238 456,725	Total	13,226,535 954.76	0 1,867,410	1,964,108	5,021.0
20-25 2,680,912 176,046 471,964 492,999 25-30 2,380,343 260,776 620,736 648,401 30-35 2,203,188 198,457 437,238 456,725		190	1–1910		
40-45 . 1,715,414 58 965 101,149 105,657 45-50 . 1,475,378 6.412 9,460 9,881	20-25 25-30 30-35 33-40 40-45 45-50	2,680,912 176.04 2,380,343 260.77 2,203,188 198.45 1,923,219 138.08 1,715,414 58.96 1,475,378 6.41	46 471,964 76 620,736 67 437,238 83 265,564 65 101,149 12 9,460	492,999 648,401 456,725 277,400 105,657 9,881	24.3 183.9 272.4 207.3 144.2 51.6 6.7

Although the age of the mother is not recorded in the largest German states, it seemed feasible to relate the births to the age groups of females on the basis of the data existing for some of the smaller states. For the three decades 1881-90, 1891-1900, and 1901-10, the average number of women by age groups, as published in Statistik des Deutschen Reichs, Vol. 246, 3. 18* (see table page 118, col. 1) has been multiplied by the fertility rates of the nine German states for which data are available (col. 2). The sum of the products (col. 3) for 1881-90 is 1,688,842 which would have been the number of births in all Germany if the fertility in each age group had been the same as in the nine Since the actual number of births in Germany was 1,798,778, the computed number of births for each age group and the fertility rate of each age group have been multiplied by 1.06510 (cols. 4 and 5), this being the ratio of the actual to the computed number of births. In a similar way the results for 1891-1900 and 1901-10 have been multiplied by 1.05178 and 1.04457 respectively.

In order to also ascertain the fertility in Germany for a more recent year the following procedure has been chosen. The number of women by age groups at the census of June 16, 1925, (see table page 120, col. 1) has been multiplied by the fertility rates of Saxony for 1924 (col. 2). The sum of the products is 1,041,189, which would have been the number of births in all Germany if the fertility in each age group had been the same as in Saxony in 1924. But the actual number of births in Germany was 1,336,327.

The female live-born were taken from Statistique Internationale du Mouvement de la Population, Vol. I, p. 327, Vol. II, p. 98, Statistisches Jahrbuch fuer das Deutsche Reich 1927, p. 27.

Norway. The average numbers of females in 1874-76, 1889-1892, and 1910-11 have been assumed to be equal to those ascertained on December 31, 1875, January 1, 1891, and Decem-

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YEARS (#1) AGE	Women Germany Juni. 16, 1925 (1)	Fertility Rates Saxony 1924 (2)	COMPUTED BIRTIS GERMANY 1925
15-20	3,257,899 3,085,907 2,839,342 2,552,713 2,318,713 2,054,090 1,986,491	17.746 101.993 113.738 79 600 45.615 16.499 1.428	57,815 314,740 322,941 203,197 105,769 33,891 2,836
Total	18,095,155		1,041,189

ber 1, 1910, respectively. The average numbers of females in 1899–1905 and 1916–20 have been estimated on the basis of the census data of January 1, 1901, December 1, 1910, and December 1, 1920. The live-born have been taken from Statistik des Deutschen Reichs, Vol. 44, p. 143, Statistique Internationale du Mouvement de la Population, Vol. I, p. 314, Statistisk Årbog 1903, p. 17, 1913, pp. 25–26, Norges Officielle Statistik, Sixth Series, No. 27, p. 256, Seventh Series, No. 151, pp. 72–75.

Sweden. For quinquennial periods from 1776 to 1900 see Statistisk Tidskrift 1906, p. 293, 1907, p. 255, Gustav Sundbärg, Bevölkerungsstatistik Schwedens 1750–1900, p. 128. The figures for the years 1901–20 have been taken from Bidrag till Sveriges Officiella Statistik A, Befolkningsstatistik 1901, p. XVI, 1902, p. XVII, 1903, p. XVIII, 1904, p. XVIII, 1905, p. XIX, 1906, p. XIX, 1907, p. XIX, 1908, p. XIX, 1909, p. XX, 1910, p. XX, Befolkningsrörelsen, 1911, p. 41*, 1912, p. 39*, 1913, p. 39*, 1914, p. 43*, 1915, p. 43*, 1916, p. 41*, 1917, p. 40*, 1918-1920, pp. 28, 31, 34, 92–97. The average number of femates by quinquennial age-groups in 1921–22 has been computed by taking the average of the number on December 31, 1920, and

December 31, 1922, as g'ven in Folkräkningen den 31. December 1920, Vol. III, p. 7, Statistisk Årsbok för Sverige 1927, p. 10. The number of confinements by quinquennial age groups in 1924—22 has been taken from Aperçu 1927, p. 169, the number of female live-born in 1921–22 from Statistisk Årsbok 1927, p. 59.

The table on pages 37-39 gives (1) the fertility rates (or confinement rates) by quinquennial age groups; (2) the total fertility, being the quintuple of the sum of the quinquennial rates and indicating the number of children born to each 1,000 newly born girls or to each 1,000 girls entering childbearing age, if all of them passed through child-bearing age; (3) the gross reproduction rate, indicating the number of girls born per newly born girl or per girl entering child-bearing age if each of them passed through child-bearing age.

- (1) The fertility rates (or confinement rates) have been computed from the tables on pages 122-28, mothers under 15 years having been included in the group 15 to 20 years, mothers over 50 years in the group 45 to 50 years. For England and Germany see pages 115, 118. The rates for Sweden 1776-1900 have been taken from Statistisk Tidskrift, 1907, p. 278.
- (2) The total fertility has been computed by multiplying the sum of the fertility rates of the quinquennial age groups by five.
- (3) The gross reproduction rate has been computed by multiplying the total fertility by the ratio that the number of female live-born bears to the number of births (or confinements) and by dividing the result by 1,000.

Women of Child-Bearing Age According to Quinquennial Age Groups, 1776-1926

Torat		486,600	583,328	668,500	776,600	874,000 908,000	10,712,239		466,442 483,275 508,396	530,984	620,400	894,00C
45 TO 50 1 LARS		49,600 54,400	59,277 63.700	67,000	77,300	89,000 97,060	1,243,968		48,874 50,593 50,358	53,070 61,002	66,500	78, 35
40 TO 45 YEARS		55,800	69,291 75,200	76,100	89,500	102,000 106,300	1,378,121		56,076 55,360 56,215	64,241	71,100	93,529
35 TO 40 YEARS		61,300	73,500	83,100	100,300	113,000	s 1,471,913		59,439 59,908 67,340	71,531	79,800	106,759 116,000
30 TO 35 YEARS	Denmark	66,700	81,569	95,500	103,000	123,000	England and Wales 30 1,519,649	Finland	63,782 69,301	78,414	80,800	119,501 119,501 127,000
25 TO 30 YEARS		76,800	89,230	105 600	113,400	136,000 144,000	Engl. 1,620,290		72,288	82,784	98,400	114 903 129,057 133,000
20 TO 25 YEARS		87,800	90,66	115,700	120,700	150,000	1,703,067		80,469 83,356 85,601	91,252	102,300	127,776 137,489 151,000
15 ro 20 Years		88,600	110,465	125,500	134,900	161,000	1,775,231		85,514 87,829	89,672	121,500	137,440 152,931 168,000
YEARS		1878-84	1895–1900	1900-10	1911–15	1910–20 1921–25 1926	1921		1866-70	1881–85	1891-1900	1901–10 1911–20 1921–25

į	00 62 62 63 63 63 63 63 63 63 63 63 63 63 63 63		586 587 .23	5	3000	952	38888 888888	
•	9,837,30°C 9,913,283 10,024,962 10,138,099 8,700,000 10,703,875 10,950,000		615,686 £586,687 779,123	, ,	1,324,300 1,395,000 1,456,000 1,501,000	750	486,060 554,200 580,994 652,500	
	1,151,700 1,131,795 1,191,245 1,223,572 1,025,000 1,332,892 1,362,000		63,456 68,284 76,331	000	127,000 143,000 154.000 166,000	40 007	48,551 57,600 60,616 -63,500	
	1,200,300 1,242,456 1,271,365 1,299,976 1,125,000 1,442,321 1,474,000		72,074 76,813 88,068		141,000 170,000 174,000 173,000	240.00	49,570 54,098 62,100 65,418 72,900	
	1,292,600° 1,349,842 1,369,646 1,403,587 1,420,000 1,498,813 1,532,000		76,138 83,565 99,201	•	172,600 175,000 188,000 201,000		50,980 62,703 69,000 70,505 77,700	
France	1,369,400 1,409,698 1,434,856 1,497,442 1,295,000 1,514,556 1,548,000	nces).	Nine German States ² 117 85,282 553 95,514 280 112,125 gian states.	Sarony	191,900 203,000 210,000 215,000	Norway	58,518 68,340 73,000 80,696 87,900	
	1,514,939 1,514,939 1,556,951 1,551,510 1,340,000 1,554,521 1,599,000	cupied pro ^{vu}	Nine 93,177 107,653 120,280 Thuringian		203,400 218,000 229,000 237,000		69,285 76,489 84,200 87,173 102,200	_
	1,708,100 1,5620,919 1,562,919 1,567,883 1,345,000 1,641,524 1,678,000	ing the 10 oc	106,195 122,374 134,766 wick, and six		236,200 236,000 246,000 254,000		83,028 82,419 98,200 100,232 119,100	
	1,675,400 1,644,334 1,602,406 1,594,129 1,350,000 1,719,248.	¹⁷⁷ provinces only (excluding the 10 occupied $pr\sigma^{vinices}$)	190 119,369 106,195 93,177 8 1-1900 132,484 122,374 107,655 9 110 148,352 134,766 120,280 11 110,280 11 110,280 11 110,280 11 110,280 11 110,280 11 110,280 11 110,280 11 110,280 11 110,280 11 110,280 11 110,280 11 110,280 11 110,280 11 110,280 11 110,280 11 110,280 11 110,280 11 110,280 11 110,280 1		252,300 250,000 255,000 255,000		90,662 93,460 113,100 118,354 129,200	
		ovinces) e, Older					.
	1892–97	177 pr	1881–90 1891–1900 1901–10		1911–14 1915–19 1920–23 1924		1874–76 1889–92 1889–190 1910–11	2

TAIAL AGE GROUPS, 1776-1926, (Continued)

(rear)	Total		550,571	560,482	575,886	589,560	011,241	620,902	636,361	646,719	608,109	082,288	710,116	735,151	180,304	850,905	880,895	925 854	908,123	1,027,184	1,058,439	
	45 TO 50 YEARS	h.	59,622	59,741	59,500	63.296	70,059	72,251	71,921	70,308	68 705	72,537	77,747	78,570	84,897	88,885	88,791	87,774	92,918	107,522	120,735	
GROUPS, 17/0-	40 TO 45 Years		63,655	64,212	68,371	74,645	77,896	77,630	77,109	73,755	77,867	82,846	85,197	90,657	94,709	94,359	93,276	99,363	111,982	128,213	136,155	
AGE (35 TO 40 Years		68,042	72,977	79,696	82,303	83,009	82,432	80,005	82,847	88,308	90,011	97,172	100,138	99,810	98,512	104,776	118,819	134,284	144,053	139,041	-
TO QUINQUENNIAL	30 TO 35 Years	Sweden	77.038	84,245	86,998	86,918	87,127	84,898	88.987	92,998	95,074	101,689	106,312	104,569	103,266	109,632	124,102	141,254	147,941	146,396	149,726	
Ассовына т	25 ro 30 Years		88.443	91.485	91,353	91,072	89,267	93,274	98,860	99.249	106,505	110,056	109.833	107.352	113.974	128,804	146,733	154,979	152,866	157.263	157.163	
AGE	20 TO 25 YEARS		05,447	05,554	05.012	91,998	07,152	102,717	104.527	110.162	114,405	113 294	112,225	117,532	133,022	151,903	150,904	158,645	158 817	156,504	103,524	1077
OF CHILD-BEARING	15 TO 20 VEARS		VC2 30	170,00 196 90	04.056	90,334	106 421	107,700	114 023	117,400	117,245	11/255	121 630	136 333	156,686	164.268	163,313	165,010	160,245	170,013	118,143	100,001
Women of	Years		00 3444	17.00-00	1/81-63	1701-90	1191-30	1/30-1600	1 1001-00 · ·	1011-15	1017 30	1671 25	1626_30	1821-25	1836.40	1000	164 ED	1010101	1001-33	, 1830-00 ·	1801-00	12002T

1,074,807 1,123,977 1,144,267 1,147,519 1,125,949 1,260,702 1,309,202 1,309,202 1,309,202 1,309,202 1,307,631 1,442,410 1,507,222
127,369 124,108 126,792 125,552 126,634 139,259 150,240 148,240 144,978 157,229
130,439 134,100 132,445 133,204 136,737 145,136 156,549 153,730 150,502 167,961 176,943
140,771 140,030 140,634 143,767 151,358, 162,562 155,622 173,622 173,632 173,632 173,632 173,632 173,632
146,677 152,132 152,523 159,523 169,453 161,841 179,308 191,957 206,490 213,991
156,069 164,100 171,664 182,525 173,507 168,936 187,663 198,117 214,077 222,970 232,970
173,343 190,338 201,767 195,648 180,733 201,023 211,221 224,156 232,400 244,691 255,180
200,139 222,504 218,533 2018,533 2019,376 231,833 244,310 244,310 244,310 256,645 275,605
1871–75 1876–80 1881–81 1881–81 1896–90 1901–05 1906–10 1911–15 1916–20

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Average Yearly Births by Quinquennial Age Groups of Mothers, 1776-1926

Yeşrs	Under 20 Ylahs	20 TO 25 YEARS	25 TO 30 Years	30 TO 35 YEARS	35 TO 40 YNARS	40 TO 45 YDARS	45 and More Years	Total	LIVE- BC			
				D								
				Denm (Couline								
1878-79	1,240	[11,121]	17,552	15,558	11,621	5,339	489	62,920	30,122			
1880-84 1885-89 1890-94 1895-1900 1901-05 1906-10 1911-15 1916-20 1921-25 1926	1,249 1,473 1,524 1,911 2,437 3,074 3,225 3,194 3,850 3,913	11,844 11,665 12,071 14,0,33 15,670 17,165 16,608 17,136 18,295 17,466	18,730 19,560 18,574 19,9)7 21,581 21,987 21,302 20,698 21,867 20,886	16,607 17,482 17,537 17,013 17,011 17,438 16,623 16,570 16,182 15,574	11,679 12,275 12,591 12,491 11,595 11,261 11,038 10,718 10,543 9,239	5,283 5,268 5,285 5,408 5,028 4,631 4,308 4,276 4,180 3,802	548 520 478 486 467 394 394 358 368 323	65,058 68,552 68,000 71,432 73,789 75,050 73,498 72,950 75,291 71,203	31,006 32,980 32,774 34,404 35,568 36,716 35,500 35,205 36,318 34,447			
			1	England ar	nd Wales							
	England and Wales (Live-Born)											
1921	27,262	183,856	252,865	209,016	142,668	30,288]	2,829	848,814	413,919			
				Finla	nd							
				(Confine								
1866-70 1871-75 1876-80 1881-85 1881-95 1891-95 1896-1900 1901-05 1906-10 1911-15 1916-20 1921-25	1,170 1,645 1,801 1,790 1,004 1,948 2,253 2,144 2,316 2,385 2,073 2,436	9,968 12,499 13,149 13,842 13,619 14,648 17,022 17,088 18,336 16,017 15,173 17,487	15,597 18,388 19,349 19,151 20,847 18,800 22,790 23,943 21,758 23,237 19,930 21,423	14,074 17,528 18,116 18,712 10,109 10,544 18,891 21,318 22,511 20,956 18,623 17 643	10,555 12,137 14,105 14,347 15,328 14,711 16,050 14,613 16,918 16,244 14,144 13,904	5,556 6,166 6,718 7,795 8,250 8,102 8,338 8,569 7,742 8,506 7,583 7,162	870 909 973 1,027 1,263 1,167 1,282 1,113 1,195 1,006 1,051 993	57,808 60,362 71,300 76,664 80,320 78,920 86,636 88,768 93,776 89,301 78,637 81,048	27,731 33,321 35,800 36,862 38,654 37,941 41,631 42,737 45,115 42,786 37,704 38,832			
				Fran								
				= and still			****					
1892-97 1898-1903 1904-07 1908-13 1914-19 1920-21 1922-25	47,825 45,806 45,394 46,324 20,242 42,277 44,520	225,208 228,826 220,773 218,461 09,122 225,697 223,850	258,280 257,355 246,323 232,822 118,541 258,210 233,658	194,233 181,259 174,688 163,339 94,333 179,198 160,137	119,347 117,146 104,093 99,388 65,055 108,621 92,284	46,971 44,344 41,552 85,359 26,205 40,110 83,771	7,736 6,459 6,113 3,315 2,393 3,600 3,066	899,600 881,195 838,936 798,008 425,891 857,713 791,280	419,940 412,100 892,496 372,762 198,310 400,223 3/1,374			
2 77 pro	vinces onl	y (excludif	g the 10	occupied p	rovinces)		·					

AVERAGE YEARLY BIRTHS BY QUINQUENNIAL AGE GROUPS OF MOTHERS, 1776-1926 (Continued)

						·			
YEARS	Under 20 Ylars	20 TO 25 Years	25 10 30 Years	30 TO 35 YDARS	35 TO 40 YEARS	40 TO 45 Years	45 AND MORE YEARS	Total	Female Live- Born
					n Siules				
			(1	live- and	still-born)				
1881-00 1891-1900 1901-10	2,243 2,737 3,454	18,820 22,361 23,725	25,860 29,673 31,366	20,324 22,101 22,252	13,869 13,912 13,698	5,781 5,351 5,193	649 560 489	87,546 96,695 100,177	=
		¹ Hesse, O	ldenburg,	Brunswic	k, and six	Thuringi	an states.		
				Saxo	my				
			(1	Live- and	still-born)				
1911-14 1915-19 1920-23 1924	7,240 2,521 4,672 4,517	37,769 16,058 30,639 25,928	37,071 21,468 34,239 26,984	24,002 14,912 22,670 17,134	15,514 9,323 11,840 9,169	5,341 3,669 4,084 2,842	394 281 205 237	127,340 69,132 108,439 86,811	59,807 32,200 50,631 40,533
				Nare					
				(Live-	Born)				
1874-76 1829 921 1899-1905 1910-11	654 697 1,228 1,244	8,410 8,224 10,788 10,411	14,475 15,575 17,152 16,082	13,963 15,717 15,387 15,160	10,822 13,119 12,503 11,614	6,657 6,983 6,840 6,865	1,524 1,440 1,248 1,080	56,505 61,794 65,206 61,465	27,515 20,135 31,683 29,808

1 Live- and still-born.

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AVERAGE YEARLY BIRTHS BY QUINQUENNIAL AGE GROUPS OF MOTHERS, 1776-1926 (Continued)

YEARS	Under 20 Years	20 TO 25 YEARS	25 TO 30 Years	30 TO 35 Years	35 TO 40 YEARS	40 TO 45 YEARS	45 AND MORE YEARS	Total	LIVE- BORN-
				Swee					
1776-80 1781-85 1786-90 1791-95 1700-1800 1801-05 1800-10 1811-15 1810-20 1821-25 1821-25 1821-25 1821-25 1836-40 1841-45 1846-50 1861-65 1866-70 1871-75 1870-80 1881-85 1886-70 1891-95 1890-10 1901-05 1908-10	2,029 2,091 1,976 1,983 2,037 1,749 1,952 1,749 1,060 1,382 1,707 1,660 1,382 1,253 1,253 1,253 1,253 1,253 1,253 1,253 1,253 1,551 1,815 2,222 2,245 2,245 2,245 2,245 2,245 2,245 2,250 2,569 4,569 5,329	11,413 10,975 11,409 11,800 11,800 11,608 11,608 11,608 11,608 14,218 14,218 14,185 14,185 14,185 14,185 14,185 14,185 16,103 17,305 10,782 21,223 20,387 21,223 21,223 22,253 23,253 26,974 26,974	18,960 18,302 18,302 19,564 19,1249 19,993 22,001 22,709 24,350 22,4709 24,350 22,450 22,450 22,450 22,501 22,501 22,501 23,502 31,286 32,293 32,293 32,444 34,572 33,660 33,660 32,884 34,953 33,103	18,715 17,896 18,786 20,362 20,467 18,914 19,019 21,227 21,905 26,561 26,563 26,562 24,452 26,584 28,841 35,475 32,874 34,739 34,321 34,333 34,333 35,386 33,447 33,438 33,438 33,387 28,912 27,708	12,979 12,429 13,149 14,408 14,408 16,837 18,102 19,970 19,970 20,671 19,970 20,671 28,504 28,504 27,409 27,200 28,525 23,237 28,505 23,237 26,872 22,337 26,872 22,337 26,872 22,337 26,872 22,337 26,872 22,337 26,670 20,000	6,758 5,684 6,294 7,108 7,203 6,939 6,938 8,014 9,134 9,032 9,134 10,001 10,907 13,622 10,908 15,822 14,035 14,988 15,825 14,035 16,035	1,550 1,225 1,325 1,435 1,414 1,303 1,327 1,510	72,404 68,668 70,683 76,711 677,076 74,181 80,445 80,445 90,723 90,704 90,723 90,587 102,658 100,710 115,388 127,028 133,993 134,108 138,737 137,614 138,836 123,970 123,557	34,982 33,801 34,148 37,039 37,160 36,458 36,458 36,952 38,053 41,622 46,812 46,123 46,522 46,123 46,123 55,211 61,380 64,747 60,265 63,819 66,400 66,400 66,400 66,270 66,270 66,270 66,286 56,626

APPENDIX D

LIFE TABLES AND FERTILITY TABLES

I. LIFE TABLES

THE tables on pages 130-33 give the female survivors at the age from 15 to 50 years in every country of Western and Northern Europe in each period for which official mortality tables and the number of births by age of mothers are available.

Denmark. 1855-1920, see Statistisk Tabelværk, Fourth Series, Letter A, No. 9, pp. 25*-26*, Fifth Series, Letter A, No. 2, p. 18*, No. 6, p. 30*, No. 8, p. 35*, No. 13, p. 39*, No. 15, p. 47*; 1921-25, see Statistisk Aarbog 1927, p. 25.

England. 1920–22, see The Registrar-General's Decennial Supplement, England and Wales 1921, Part I, Life Tables, p. 60.

Finland. 1881-90, see Éléments Démographiques Principaux de la Finlande pour les Années 1750-1890, Vol. II, pp. 376-377; 1901-20, see Annuaire Statistique de Finlande 1927, p. 63.

France. 1898-1903, see Résultats Statistiques du Recensement de 1901, Vol. IV, pp. 69-70; 1908-13, see Annuaire Statistique 1921, p. 16.

Germany. 1881-1910, see Statistik des Deutschen Reichs, Vol. 246, pp. 16*-17*.

Sweden. 1816–1910, see Tables de Mortalilé et de Survie en Suède pour les Années 1816–1910, pp. 26–27; 1911–20, see Statistisk Årsbok för Sverige 1927, pp. 62–63

Femali Survivors in Child-Bearing Age, 1816-1925 (per 100,000 Live-Born)

77				DENMARK			
YEARS OI AGE	1885-94	1895–1900	1901-05	1906-10	1911–15	1916-20	1921-25
15	75,786	80,246	83,856	85,596	87,094	87,235	89,724
96	75,357	79,925	183,571	85,346	86,888	86,98 9	89,350
17	74,932	79,590	83,267	85,075	86,650	86,705	89,354
18	74,509	79,245	82,952	84,789	86,388	86,374	89,130
19	74,089	78,897	82,627	84,491	86,108	85,992	88,892
20	73,672	78,547	82,294	84,180	85,820	85,583	88,642
21	73,262	78,192	81,955	83,862	85,523	85,177	88,381
22	72,860	77,831	81,606	83,537	85,208	84,758	88,129
23	72,459	77,465	81,247	83,203	84,884	84,293	87,879
24	72,049	77,092	80,880	82,857	84,560	85,829	87,599
25	71,624	76,707	80,506	82,500	84,231	83,374	87,307
26	71,179	76,313	80,129	82,134	83,900	82,875	87,016
27	70,720	75,912	79,748	81,760	83,570	82,363	86,739
28	70,249	75,503	79,360	81,377	83,226	81,855	86,481
29	69,772	75,085	78,965	80,989	82,873	81,323	86,191
30	69,292	74,659	78,555	80,598	82,511	80,785	85,869
31	68,812	74,221	78,131	80,205	82,131	80,269	85,571
32	68,328	73,770	77,700	79,806	81,731	79,777	85,266
33	67,839	73,310	77,264	79,399	81,331	79,276	84,933
34	67,342	72,842	76,817	78,987	80,946	78,753	84,615
35	66,834	72,369	76,365	78,565	80,557	78,230	84,278
36	66,318	71,893	75,911	78,133	80,138	77,725	83,933
37	65,796	71,416	75,449	77,697	79,693	77,242	83,575
38	65,262	70,936	74,980	77,253	79,250	76,767	83,181
39	64,712	70,452	74,502	76,803	78,803	76,261	82,786
40	64,142	69,963	74,007	76,341	78,336	75,736	82,392
41	63,559	69,462	73,493	75,865	77,871	75,230	81,986
42	62,978	68,944	72,970	75,375	77,411	74,731	81,557
43	62,399	68,412	72,443	74,870	76,923	74,226	81,123
44	61,820	67,867	71,913	74,352	76,415	73,709	80,673
45	61,243	67,308	71,377	73,818	75,905	73,165	80,170
46	60,669	66,751	70,825	73,276	75,378	72,602	79,638
47	60,096	66,190	70,253	72,728	74,843	72,050	79,111
48	59,520	65,609	69,659	72,165	74,298	71,506	78,558
49	58,937	65,000	69,044	71,587	73,698	70,936	77,950
50	58,344	64,364	68,405	70,990	73,038	70,326	77,308

Female Survivors in Child-Bearing Age, 1816-1925 (per 100,000 Live-Born)

<u> </u>	1					
YEARS	ENGLAND		FINLAND		FRAN	ICE
OF AGE	1920-22	1881-90	1901-10	1911-20	1898–1903	1908-13
15	87,067	69,916	75,097	77,777	77,248	81,566
16 : .	86,869	69,573	74,616	77,310	76,903	81,208
17 : .	86,658	69,211	74,146	76,815	76,527 -	80,923
18 : .	86,432	68,830	73,671	76,300	76,124	80,560
19 : .	86,191	68,438	73,229	75,789	75,696	80,168
20 : .	85,938	68,034	72,782	75,259	75,246	79,750
21	85,675	67,619	72,338	74,702	74,774	79,312
22	85,404	67,200	71,875	74,127	74,285	78,858
23	85,126	66,770	71,422	73,571	73,780	78,391
24 .	84,843	66,329	70,972	73,027	73,261	77,918
25	84,553	65,878	70,518	72,465	72,732	77,437
26	84,257	65,423	70,053	71,878	72,197	76,948
27	83,955	64,965	69,549	71,303	71,661	76,456
28	83,649	64,510	69,041	70,718	71,129	75,962
29 .	83,337	64,052	68,516	70,166	70,599	75,468
30	83,019	63,584	68,009	69,619	70,068	74,972
31	82,694	63,101	67,513	69,083	69,536	74,472
	82,362	62,603	67,040	68,530	69,002	73,967
	82,021	62,090	66,557	67,968	68,465	73,459
	81,672	61,575	66,078	67,377	67,923	72,950
	81,314	61,052	65,569	66,825	67,377	72,442
36	80,947	60,527	65,058	66,257	66,825	71,934
	80,571	59,988	64,505	65,714	66,269	71,423
	80,186	59,448	63,970	65,149	65,709	70,897
	79,790	58,901	63,426	64,608	65,147	70,361
	79,381	58,347	62,900	64,065	64,583	69,814
41 42 43 44 45	78,959	57,787	62,328	63,514	64,015	69,255
	78,522	57,226	61,767	62,942	63,441	68,687
	78,070	56,659	61,217	62,363	62,859	68,118
	77,600	56,098	60,709	61,783	62,266	67,541
	77,109	55,543	60,199	61,208	61,661	66,949
46 47 48 49	76,594 76,053 75,484 74,883 74,246	54,988 54,427 53,856 53,264 52,646	59,657 59,102 58,541 57,979 57,388	60,627 60,039 59,391 58,726 58,027	61,043 60,409 59,757 59,084 58,385	66,335 65,701 65,036 64,345 63,630

Female Survivors in Child-Bearing Age, 1816-1925 (per 100,000 Live-Born)

Years		GERMANY			Swedin	
of Age	1881-90	1891-1900	1901-10	1816-40	1841–50	1851-60
15 16 17 18 19	65,306 65,045 64,764 64,468 64,160 63,838	69,562 69,319 69,060 68,787 68,500 68,201	74,887 74,661 74,411 74,143 73,861 73,564	71,940 71,610 71,260 70,900 70,520 70,120	74,095 73,766 • 73,419 73,067 72,712 72,352	71,579 71,335 70,865 70,489 70,148 69,741
21	63,500	67,888	73,254	69,700	71,980	69,382
22	63,142	67,559	72,929	69,280	71,587	68,997
23	62,762	67,212	72,586	68,840	71,176	68,596
24	62,360	66,848	72,225	68,370	70,763	68,174
25	61,937	66,467	71,849	67,890	70,338	67,728
26	61,497	66,072	71,463	67,390	69,913	67,301
27	61,042	65,666	71,070	66,880	69,476	66,860
28	60,570	65,249	70,669	66,340	69,038	66,416
29	60,082	64,822	70,261	65,790	68,589	65,944
30	59,584	64,385	69,848	65,230	68,126	65,446
31	59,076	63,937	69,432	64,660	67,636	64,936
	58,554	63,479	69,008	64,070	67,118	64,400
	58,018	63,010	68,575	63,470	66,592	63,920
	57,473	62,533	68,132	62,870	66,049	63,339
	56,921	62,047	67,679	62,250	65,487	62,750
36	56,360	61,549	67,215	61,620	64,914	62,172
	55,789	61,041	66,744	60,980	64,314	61,548
	55,215	60,524	66,266	60,320	63,696	60,938
	54,638	59,998	65,779	59,640	63,066	60,341
	54,054	59,467	65,283	58,960	62,416	59,665
41	53,467	58,931	64,779	58,260	61,752	59,039
42	52,880	58,391	64,269	57,550	61,072	58,360
43	52,297	57,848	63,754	56,820	60,382	57,659
44	51,720	57,302	63,238	56,090	59,679	56,956
45	51,146	56,751	62,717	55,320	58,969	56,298
46	50,569	56,195	62,181	54,540	58,258	55,639
47	49,983	55,628	61,628	53,740	57,544	54,913
48	49,385	55,040	61,053	52,930	56,822	54,175
49	48,765	54,423	60,449	52,100	56,098	53,457
50	48,110	53,768	59,812	51,260	55,363	52,698

Female Survivors in Child-Bearing Age, 1816-1925 (per 100,000 Live-Born)

YDARS	****		SWE	DEN (Contin	ucd)		
of Age	1861-70	1871-80	1881-90	1891–1900	1901-10	1911-15	1916-20
15	72,670	74,947	77,833	80,910	85,060	87,847	87,579
16	32,370	74,632	77,502	80,559	84,704	87,513	87,181
17	72,060	74,308	77,158	80,194	84,313	87,145	86,715
18	71,750	73,976	76,808	79,828	83,905	86,767	86,205
19	71,410	73,636	76,449	79,428	83,486	86,367	85,664
20	71,070	73,283	76,080	79,005	83,064	85,938	85,106
21	70,710	72,915	75,703	78,585	82,627	85,501	84,537
22	70,350	72,532	75,317	78,154	82,170	85,068	83,961
23	69,970	72,135	74,920	77,705	81,705	84,632	83,380
24	69,5 9 0	71,724	74,510	77,240	81,252	84,193	82,777
25	69,180	71,296	74,089	76,771	80,790	83,725	82,169
26	68,780	70,851	73,655	76,303	80,309	83,246	81,540
27	68,370	70,391	73,212	75,835	79,822	82,783	80,901
28	67,950	69,921	72,766	75,382	79,346	82,323	80,277
29	67,530	69,444	72,320	74,922	78,874	81,883	79,664
30	67,090	68,964	71,868	74,449	78,400	81,477	79,065
31	66,640	68,481	71,405	73,974	77,920	81,027	78,474
32	66,190	67,995	70,938	73,496	77,455	80,559	77,889
33	65,710	67,504	70,469	73,012	76,992	80,100	77,309
34	65,250	67,006	70,000	72,535	76,518	79,640	76,734
35	64,740	66,498	69,521	72,053	76,031	79,178	76,173
36	64,220	65,985	69,030	71,547	75,537	78,707	75,620
37	63,700	65,464	68,529	71,044	75,044	78,230	75,073
38	63,180	64,931	68,021	70,550	74,539	77,742	74,535
39	62,610	64,380	67,501	70,031	74,028	77,264	74,009
40	62,040	63,819	66,969	69,499	73,519	76,772	73,475
41	61,430	63,252	66,429	68,967	73,005	76,251	72,935
42	60,840	62,685	65,887	68,427	72,483	75,713	72,394
43	60,220	62,118	65,350	67,893	71,959	75,171	71,860
44	59,600	61,554	64,816	67,356	71,436	74,639	71,326
45	59,010	60,992	64,277	66,808	70,900	74,107	70,780
46	58,380	60,429	63,724	66,260	70,356	73,574	70,231
47	57,760	59,857	63,160	65,718	69,812	73,030	69,673
48	57,120	59,270	62,593	65,181	69,223	72,465	69,122
49	56,480	58,661	62,018	64,601	68,641	71,888	68,547
50	55,780	58,029	61,430	63,995	68,027	71,283	67,950

II. FERTILITY TABLES

The tables on pages 135-38 give (1) the years lived by 1,000 live-born females in each quinquennial age group from 15 to 50 years according to the life tables; (2) the births (or confinements) per 1,000 women for each quinquennial age group from 15 to 50 years; (3) the births (or confinements) per 1,000 women for each quinquennial age group from 15 to 50 years adjusted to the age composition derived from the life table.

- (1) The years lived by 1,000 live-born females in each age group are derived from the number of female survivors of the life table by assuming that the years lived by 1,000 women of 15 to 16 years would be equal to the average of the women surviving 15 and those surviving 16 years, etc. The number of female survivors has been taken from the life tables given on pages 130-33 with the exception of those for Denmark 1926, Finland 1921-25, France 1920-21, 1922-25, Germany 1925, Sweden 1921-22. Since so far no official life tables have been calculated for those recent periods, we have computed abbreviated life tables ourselves by using the method of Becker-Zeuner, as simplified by Rahts, with the modification for the first year of age suggested by the author in Vierteljahrsberichte des Statistischen Amts der Stadt Schweberg 1911, II, pp. 49-50.
- (2) The fertility rates have been taken from the table on pages 37-39, or computed on the basis of data taken from the sources quoted in Appendix C.
- (3) The adjustment of the fertility rates to the age composition derived from the life table has been effected by multiplying (1) by (2).

FERTILITY TABLES, 1816-1926

Years Property 1885-94 1895-1895-1895-1895-1895-1895-1895-1895-	1901-05 1901-05 1901-05 1901-05 17-02 17-0	1901-05 1906-10 1911. Pears Lived by 1,000 Live-born Females 4,154.92 4,154.89 4,324.90	1911-15 Females 4,324.91 4,252.01 4,252.01 4,076.73 3,973.30 3,877.41 3,726.88 28,380.64	4,224.63 4,225.36 4,225.36 4,025.36 3,935.83 3,538.46 3,588.40 3,588.40	4,392.63 4,392.63 4,392.63 4,392.63 4,392.63 4,168.10 4,066.20 3,999.96	1926, 4,482 4,436 4,202 4,202 4,202 4,202 4,202 4,202 4,202 4,283 6,202 4,202
15-20 3,736.16 3,976 20-25 3,532.78 3,786 30-35 3,532.78 3,786 30-35 3,543 30-45 3,743.88 3,576 30-45 3,743.88 3,576 45-50 2,990 16 3,290 Total 23,696 96 25,599 15-20 132.6 224 30-25 224 8 35-40 133.6 65-50 57-90 68 65-50 57-90 68	Pears Lived by 4,154.92 4,070.88 3,977.33 3,760.28 3,635.11 3,496.72 26,968 96 Confinement 20.11 143.11 225.3	1,000 Live-born 4,245.89 4,058.09 4,078.09 3,979.79 3,873.41 3,621.60 77,712.16 12 per 1,000 W	Females 4,321.91 4,322.01 4,162.40 4,106.40 3,9713.30 3,877.41 3,726.88 28,380.64 28,380.64 23.9	4,324.63 4,025.36 4,049.95 5,475.83 3,497.88 3,723.46 3,588.40	4,461 09 4,399,63 4,330,15 4,254,58 4,168 10 4,066 20 3,939 96 29,619,71	4,482 4,482 4,359 4,350 4,202 4,202 4,700 8,979 2,979
3,736.16 3,632.78 3,532.78 3,5403.84 3,513.46 3,134.46 3,134.46 3,134.46 3,134.46 3,134.46 3,134.46 3,134.46 125.59 1000 9200 8700 8700 8700 8700 8700 8700 8700 8	4,154.92 4,070.88 3,071.33 3,673.12 3,635.11 3,496.72 26,968 96 Confinemen 20.1 143.1 123.3	4,245.89 4,067.99 4,077.09 3,873.79 3,775.41 3,621.60 27,722.16 tt per 1,000 W	4,324.91 4,252.01 4,169.40 4,076.73 3,973.30 3,877.41 3,726.88 28,380.64 28,380.64	4,724.63 4,725.36 4,004.93 5,919.78 3,519.78 3,518.40 27,792.41	4,461 09 4,399 15 4,390 15 4,390 15 4,168 10 4,066 20 3,939 96 29,619.71	4,482 4,426 4,426 4,283 4,202 4,100 4,100 29,836
3,632,78 3,632,78 3,632,78 3,633,78 3,275,76 3,275,76 3,558 3,574 3,696,96 132,6 132,6 132,6 132,6 132,6 140 133,7 140 140 140 140 140 140 140 140 140 140	4,070.88 3,977.33 3,873.73 3,873.73 3,635.11 3,496.72 26,968 96 Confinemen 20.1 143.1 125.3	4,167.99 4,08.09 3,979.79 3,735.41 3,621.60 27,722.16 12 per 1,000 W	4,252.01 4,169.40 4,076.73 3,973.30 3,857.41 3,726.88 28,380.64 28,380.64	4,225 36 4,725 36 3,975 83 3,539 78 3,773 46 5,588 40	4,399.63 4,330.15 4,254.58 4,168.10 4,066.20 3,939.96 29,619.71	4,426 4,438 4,202 4,100 4,100 2,979 2,836
3,523.78 3,403.84 3,403.84 3,5175.76 3,134.48 3,134.48 3,134.48 3,134.48 3,134.48 3,134.48 3,134.48 3,134.8 3,	3,977.33 3,977.33 3,635.13 3,635.11 3,496.72 26,968 %	4,030,00 4,030,00 3,970,70 3,755,41 3,621,60 27,712,16 tt per 1,000 W-	4,169.40 4,169.40 3,073.30 3,857.41 3,726.88 28,380.64 28,380.64	4,104.95 3,975.83 3,949.78 3,723.46 3,588.40 27,792.41	4,330 15 4,34,58 4,168 10 4,066 20 3,939 96 29,619.71	4,359 4,202 4,100 3,979 29,836
20-25	3,971.33 3,873.73 3,673.13 3,496.72 26,968 96 Confinemen 20.1 143.1 125.3	240/8/09 3,979.70 3,873.39 3,757.41 3,621.60 27,722.16 424.5 14.8	4,109.40 4,076.73 3,973.30 3,857.41 3,726.88 28,380.64	3,975.83 3,849.78 3,723.46 3,588.40 27,792.41	4,254.58 4,168.10 4,066.20 3,939.96 29,619,71	4,288 4,202 4,100 3,979 29,836
3,403.84 3,431.48 3,131.48 3,131.48 3,131.48 3,131.48 3,131.48 3,131.48 3,131.48 3,131.48 3,131.48 3,131.48 3,131.48 1,100 1,2	3,873.72 3,760.28 3,496.72 26,968 % Confinemen 20.1 143.1 193.1 193.1	3,979.79 3,775.41 3,621.60 27,722.16 148 per 1,000 W.	3,470.7.3 3,857.41 3,726.88 28,380.64 0men	3,549 78 3,723 46 3,588 40 27,792.41	4,168.10 4,166.20 3,939.96 29,619.71	4,202 4,100 3,979 29,836
3,275,76 3,558 3,13148 3,239 1,290 1,23,696,96 1,25,59 1,32,6 1,32,6 1,33,7 2,24 2,24 1,0 1,0 1,0 1,0 1,0 1,0 1,0 1,0 1,0 1,0	3,760.28 3,635.11 3,496.72 26,968 % Confinemen 20.1 143.1 125.3 198.1	3,873 39 3,755 41 3,621.60 27,722 16 ts per 1,000 W.	3,973 30 3,857.41 3,726 88 28,380.64 omen	3,549 /8 3,723 46 3,588 40 27,792.41	4,066 20 3,939 96 29,619.71	29,836
3,13148 3,433 2,900 16 3,739 10 23,696 96 25,599 122,6 22,48 123,7 224 133,4 209 183,4 170 90,0 78 92,00 78	3,635.11 3,496.72 26,968 96 Confinemen 20.1 143.1 143.1 198.1	3,621.60 27,722.16 27,722.16 148 per 7,000 Weils 24.5 148 4	3,857.41 3,726.88 28,380.64 omen 23.9	3,723,46 3,588,40 27,792,41	3,939 96 29,619.71	29,836
15.5 2,990 16 3,723 16. 23,696 96 25,596 13.2 6 140 13.2 6 140 13.3 7 224 2.3 8 220 18.3 4 170 9.0 78 9.0 78	3,496.72 26,968.96 Confinemen 20.1 143.1 193.1 198.1	3,621.60 27,722.16 4s per 1,000 Wr 148.4	3,726 88 28,380.64 omen 23.9	3,588 40	3,939 96	29,836
15.5 17 15.5 14 13.2 6 23.7 224 23.7 224 183.4 170 90.0 78 92.0 77 77 90.0 68	26,968 96 Confinemen 20.1 143.1 225.3 198.1	27,722 16 tts per 1,000 W(24.5)	28,380.64 omen 23.9	27,792.41	29,619.71	29,836
15.5 17 12.6 12.5 17 13.6 140 13.3 7 2.24 13.8 2.09 18.3 4 1.00 9.0 78 9.0 78 77 90 68	Confinement 143.1 225.3 198.1	24.5 128.40 W. 24.5 128.4	28,380.04 omen 23.9	71,757,17	Tricator 1	1 236
15.5 17 132.6 1440 233.7 2293 2243.7 2293 183.4 170 90.0 78	Confinemen 20.1 143.1 225.3 198.1	ts per 1,000 W. 24.5		Š	;	1 236
15.5 132.6 233.7 234.8 124.8 124.8 120.0 90.0 92.8 8	Confinemen 20.1 143.1 225.3	ts per 1,000 We 24.5		Š	;	1 236
15.5 17 13.5 23.7 23.7 224.8 183.4 200 183.4 170 90.0 78	20.1 143.1 225.3 198.1	245	23.9	•		1 23.6
15.5 1.35.6 2.33.7 2.33.7 2.24 2.24 2.24 2.24 2.24 2.24 2.24 2.	20.1 143.1 225.3 198.1	245 1484	23.9			
132.6 233.7 233.7 224.8 183.4 170 90.0 8 9.2 8	225.3 198.1	1-184	27.64	122.1	122.0	114.0
234.8 224.8 200.0 183.4 200.0 78 92.0	198.1		137.0	173 5	160.8	145.1
224 8 200 1834 170 90.0 78	198.1	7,02,7	187.0	173.0	131.5	122.6
100 1834 170 1834 170 184 170 184 170 184 170 184 184 184 184 184 184 184 184 184 184		0 781	101.4	1951	22.0	12
920 78	150.0	135.5	1190	201		3,5
9.2 8	6.99	8.00	77.7	47.0	1.0	30
57.00	7.3	5.9	5.5	Q.F	T-#	C;
22.00						
57.90 1 68	Confinements per 1,000 Women in Stationary Population	Fornen in Statio	nary Population	_		
- 2200		00000	2000	_	単い107 07	106
	23.00	105.55	103.37	25.55	25 955	300
481.89	582.56	618 30	282.08	240.00	2000	0 000
823 57	895.99	849.10	783.01	77.77	9 050 29	355
765.10	767.59	726.71	657.98	28882	359 50	920
02.009	564 05	524 89	475.21	410 00	388 88	35
282 22 270 90	243.05	228.53	209.07	17.98	17007	141
	2563	21 28	05:07	10.01	Crar	
4 050 70	2 160 47	3 077 86	2 834 22	2 544 47	2,471 34	2,267
	11.00140	2		 		

FERTILITY TABLES, 1816-1926

	ENGLAND		FINLAND	OX.			FRANCE	8	
YEARS OF AGE	1921	1881-90	1901–10	1911-20	1921–25	1898-1903	1908–13	1920-21	1922-25
			Years	Years Lived by 1,000 Live-born Penules	Live-born Fen	nales	•		
15-20	4,326.53	3,450.27	3,696 02	3,827.32	4,125	3,814 97	4,035.67	4,139	4,289
25-25	4,189.84	3,236.81	3,464.22	3,551.07	3,887	3.569.86	3,810.38	3,913	4,070 3,055
30-35	4,109.16	3,116.87	3,339.77	3,271.73	3,656	3,299.30	3,557.43	3,671	3,842
26.55 7.55 7.55 7.55 7.55 7.55 7.55 7.55	3,786.92	2,706.29	2,940.73	3,132.39	3,535	3,157.03	3,419.83 3,267.06	3,544 3,403	3,575
Total	28,607.75	21,691.77	23,310.95	23,871.20	26,381	23,981.69	25,706.65	26,501	27,638
	Live-barn per 1.000 Woness		Confinements pe	Conferencents per 1,000 Women		Liv	Cive- and still-born per 1,000 (Vomens	per 1,000 (Von	312:
981 20-25 25-30 30-35	15.3 108.0 156.1 137.5	19.0 153.7 234.1 239.6	16.2 138.5 211.9 216.0	14.6 116.7 167.7 165.6	14.5 115.8 161.1 138.9	27.8 141.2 169.9 128.6	28.4 139.3 150.1 109.1	24.6 137.5 166.1 118.3	25 3 133 4 146 1 103 5
35-20 40-45 45-50	22.0 22.0 23.0 25.0	202.5 121.2 19.2	184-9 106.0 16.0	86.0 13.1	68.8 10.7	35.7	27.2	27.8	22.9
	Line-born per 1,000 Women in Stationury Population		Confinements per 1,000 Women in Stationary Population	r,000 Women Population		Line	Live- and still-born per 1,000 Women in Stationary Population	per 1,000 Won. Population	<i>113</i>
20-25 20-25 30-35 30-35	66.44 460.23 653.99 565.13	65.69 514.57 757.97	59.97 496.32 734.15 721.52	55.78 430.95 595.40 565.69	60 464 626 524 538	108.27 522.46 606.44 441.86	114.74 547.69 571.79 402 251.90	102 555 550 449 866	25 50 50 50 50 50 50 50 50 50 50 50 50 50
46-45 45-50	. 86.03 8.61	345.19 52.0	325.99	269.43 39.13	36.33	112.68	93.02 8.85	96 6	
Total .	2,229.90	3,086.82	2,978 58	2.421.32	2,391	2,093.19	1,990 01	1, 2,130	1,996
			-						

				Ğ	Germany			SWEDLY	
	YEARS OF AGE		1881–90	1891-1900	1901–10	1925	1816-40	1811-50	1851–60
1		1-		Years	Years Lived by 1,000 Live-barn Females	ive-born Females			
15-20 20-25	• •	• •	3,230 09	3,445.48	3,713.01	4,305	3,553.20	3,568.51	3,533.97
25-30	•	:	3,039.51	3,272.35	3,543.12	4,163 4,078	3,188.10	3,342.01	3,231 08
888 848	 		2,774.90	3,038.69	3,324.85	3,987	3,031.65	3,199.42	3,062.06
45-50			2,483.30	2,765.45	3,065.75	3,760	2,666 00	2,858.88	2,720.82
Total		·	20,217.69	21,957.94	23,923.23	28,418	22,079 10	23,128.95	22,199.66
10			Li	ive- and still-born	Live- and still-born per 1,000 Women	12	Confin	Confinements per 1,000 Women	Women
15-20 20-25 30-35 4-64 51-40			20.0 188.8 295.6 253.8 194.0 185.0	21.7 192.2 289.9 243.4 175.1 7.3 8.6	24.3 183.9 272.4 207.3 144.2 61.6 6.7	22.8 131 0 146.0 102.2 58.5 21.1	13.2 120.8 223.3 240.6 195.3 107.1	8.0 97.8 236.5 237.1 198.5 108.9	7.8 97.7 232.3 235.3 203.3 116.0 18.5
2			ptr 1	Live- and Jooo Women in	Live- and still-born for 1,000 Women in Stationary Population	tion	per 1,000 W	Consinements. per 1,000 Wonen in Stationary Populatian	y Population
15-20 20-25 30-35 40-45			64 63 593.92 898.55 739.39 538.38 27.66	74.87 647.36 948.68 769.47 532.08 23.86	90.30 668.82 965.14 712.93 479.57 197.12 20.53	98 555 608 417 233 82 7	46 79 417.05 743.69 767.01 595 11 50 96	29.42 348.82 715.16 712.49 635.03 50.49	27.54 335.88 673.90 724.61 625.68 336.44 50.34
Potal	. · . :	1	3,086.77	3,209.25	3,134.41	2,000	2,923.74	2,902.07	2,801.39

FERTILITY TABLES, 1816-1926

Yeaks of Age 1861-70 1871-80 1881-90 1891-1900 1901-10 1911-15 1916-20					Sat	Sutden (confinued)				
15-20 3.594 60 3.706.67 3.888.74 3.999.67 4.346.85 4.321.08 4	YEARS OF AGI		861-70	1871-80	1881-90	1891-1900	1901-10	1911–15	1916-20	1921–22
15-20 3,594 60 3,706 67 3,548.74 3,999 67 4,204.70 4,46.85 4,321.08 2,24.25 2,24.25 3,609.81 2,322.25 4,029.25 3,609.81 2,322.25 4,029.25 3,609.81 2,322.25 4,029.25 3,609.81 2,322.25 4,029.25 3,609.81 3,230.15 3,230.16 3,230.16 3,230.18 3,230.20 3,230.18 3,230.20 3,23					Years Lined b	y 1,000 Live-born	Females		c	
20-25 3,507,53 <t< td=""><td>15-20</td><td>£,</td><td>594 60</td><td>3,706.67</td><td>3,848.74</td><td>3,999.67</td><td>4,204.70</td><td>4,346.85</td><td>4,321.08</td><td>4,480</td></t<>	15-20	£,	594 60	3,706.67	3,848.74	3,999.67	4,204.70	4,346.85	4,321.08	4,480
3,297.05 3,327.05 3,335.06 3,662.68 3,610.01 4,010.54 3,820.25 3,297.05 3,240.18 3,241.26 3,240.76 3,610.22 3,999.18 3,400.61 3,240.13 3,241.26 3,241.76 3,409.28 3,409.18 3,409.38 45-50 2,871.35 2,977.27 3,432.49 3,417.20 3,417.21 3,409.38 45-50 2,871.35 2,977.27 24,626.26 25,557.65 26,967.09 28,041.83 27,720.66 27,720.66 5,240.2 2,247.27 24,626.26 25,557.65 26,967.09 28,041.83 27,230.66 27,230.20 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.20 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.20 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.20 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.66 27,230.20 27,230.66	20-35	m (r)	507.05	3,507.95	3,649.32	3,780.52	3,979 46	4,128.36	4,029.99	4,296
35-40 3,171	30-35		297.05	3,387.17	3,535.06	3,662.68	3,861.01	4,016.54	3,880.25	4,197
Total	35-40 50-45	 www	,171 00 ,026.15 871.35	3,259.18 3,120.15 2,977.27	3,413.26 3,281.05 3,143.49	3,539.48 3,407.96 3,271.62	3,739 23 3,610 92 3,474.96	3,899.18 3,772.13 3,636.52	3,4001 3,606.43 3,469.38	4,092 3,978 3,850
15-20 8.8 9.6 10.5 113.8 121.8 119.5 16.9 20-25 20.10 20.25 100.4 100.4 100.5 20-25 20.10 20.10 20.25 100.5 100.5 20-25 20.10 20.20 20.20 20.20 20.20 20-25 20.20 20.20 20.20 20.20 20-25 20.20 20.20 20.20 20.20 20-25 20.20 20.20 20.20 20-25 20.20 20.20 20.20 20-25 20.20 20.20 20.20 20-25 20.20 20.20 20.20 20-25 20.20 20.20 20.20 20-25 20.20 20.20 20.20 20-25 20.20 20.20 20.20 20-25 20.20 20.20 20.20 20-25 20.20 20.20 20.20 20-25 20.20 20.20 20.20 20-25 20.20 20.20 20.20 20-25 20.20 20.20 20.20 20-25 20.20 20.20 20.20 20-25 20.20 20.20 20.20 20-25 20.20 20.20 20.20 20-25 20.20 20	Total	1 2	875.15	23,573.77	24,626.26	25,557.65	26,967.09	28,041 83	27,230.66	29,286
15-20 8.8 9.6 10.5	10				Сопппете	nts per 1,000 W	omen			
101.7 106.4 106.3 113.8 121.8 113.3 105.5 201.9 201.3 201.3 201.4 109.9 105.2 188.4 188.7 201.9 201.3 201.3 201.4 109.9 105.3 148.7 201.9 201.3 201.3 201.4 109.8 105.3 148.7 118.3 119.4 110.9 115.7 118.4 130.4 111.0 118.3 119.4 110.9 115.7 113.4 130.4 130.4 118.3 119.4 110.9 110.9 110.9 119.4 110.9 110.9 110.9 110.5 13.7 105.7 105.4 105.7 110.6 13.7 105.7 105.4 105.7 110.6 105.2 105.7 105.4 110.6 105.2 105.7 110.6 105.2 105.7 110.6 105.2 105.7 110.6 105.2 105.7 110.6 105.2 105.7 110.6 105.2 105.7 110.6 105.2 105.7 110.6 105.2 105.7 110.6 105.2 105.7 110.6 105.2 105.7 110.6 105.2 105.7 110.6 105.2 105.7 110.6 105.2 105.7 110.6 105.2 105.7 110.6 105.2 105.7 110.6 105.2 105.7 110.6 105.2 105.7 110.6 105.2 105.7 110.6 105.7 105.7 110.6 105.7 105.7 110.6 105.7 110.6 105.7 105.7 110.6 105.7 110.7 110.7 110.7 110.7 110.7 110.7 110.7	9	•	9	30	202	12.7		10.5	16.9	19.3
2019 2018 1999 1942 1899 1653 14887 2019 2019 2019 2019 2019 2019 2019 2019	15-20	-	101.7	106.4	106.3	113.8	121.8	113.3	105.5	105.7
2299 203 2233 2219 125.5 158.4 158.5 110.0 188.1 110.0 158.5 110.0 158.5 110.0 158.5 110.0 158.5 110.0 158.5 110.0 158.5 110.0 159.5 110.0	25-30		201.9	208.5	199.0	194.2	1899	163.3	1487	42.7
118.3 119.4 110.9 98.7 83.4 69.2 58.7 15.8 18.8 16.7 16.7 16.7 16.7 16.7 16.7 16.7 16.7	30–35	-	229.3	233.3	102 8	1757	1524	130.4	11.0	102.3
18.8 18.6 16.7 13.3 10.5 8.1 7.3 31.46 35.44 40.45 42.09 75.18 48.076 441.10 536.55 334.86 399.08 42.09 47.56 674.06 599.14 556.19 790.07 729.49 755.65 673.82 637.85 557.91 575.56 538.35 538.35 538.35 557.91 557.56 538.35 538.35 55.26 55.39 55.35 54.04 56.69 558.123 3,034.28 3,027.83 2,973.34 2,674.36 2,309.20 558.123 3,034.28 3,027.83 2,973.34 2,674.36 2,309.20	40-45		118.3	119.4	110.9	98.7	83.4	69.2	587	52.6
Confinements per 1,000 Women in Stationary Population 35.44 40.45 35.44 40.45 34.56 39.08 442.09 45.56 30.755.63 674.06 599.14 688.06 675.09 664.09 653.15 622.46 577.93 508.35 543.30 553.09 553.56 302.17 201.18 22.45 37.56 302.17 201.18 22.45 37.56 302.17 201.18 22.45 37.56 302.17 201.18 22.45 37.56 302.17 201.18 22.45 37.56 302.17 201.18 22.45 37.56 302.18 22.45 302.25 303.25	45-50	-	18.8	18.6	16.7	13.3	105	8.1	1.3	0.7
3.5.46 35.44 40.45 54.56 75.18 84.68 73.22 3.56.55 3.54.86 3.99.08 44.20 47.96 460.76 480.76 441.10 6.88.06 7.90.07 7.94.23 7.55.63 674.06 599.14 6.57.07 7.90.07 7.84.23 7.52.65 777.78 63.5 82 543.30 6.57.07 6.57.03 36.24.6 377.79 508.35 3415.22 6.57.07 36.52 36.24.6 302.17 261.18 241.52 7.57.91 36.50 37.24.6 36.59 35.39 415.22 7.58.13 36.34.28 3.02.34 2.987.11 2.973.34 2.674.36 2.309.20 7.50.20	•			Conf	inemenis per 1,000	o Women in Statia	mary Population			
356,55 348 86 399,08 442,09 49,09 460,70 460,70 460,70 460,70 599,14 656,10 790,07 794,23 752,63 775,64 674,06 599,14 657,10 790,07 784,23 752,65 727,78 638,35 943,30 657,08 657,08 658,15 622,46 377,93 508,35 415,22 657,08 372,51 36,69 377,79 36,69 415,22 737,91 372,52 32,53 44,04 36,69 20,51 25,39 7,881,23 3,034,28 3,027,83 2,987,11 2,973,34 2,674,36 7,674,36 7,674,36 7,309,20 7	15-20	_	31.46	35.44	40.45	54.56	75.18	84.68	73.22	87
756.19 790.07 784.23 752.65 727.78 633.82 543.30 657.08 664.39 658.15 672.46 577.93 508.35 415.22 657.01 372.56 362.46 302.17 261.18 241.52 55.26 35.56 32.53 44.04 36.69 20.51 25.39 7.881.23 3,034.28 3,027.83 2,987.11 2,674.36 2,674.36 2,309.20	20-25		356.55	384 86	399.08	442.09	755.96	480.76 674.06	599.14	- Fig
637 08 664.59 638.15 622.46 577 93 508.35 418.22 448.22 537 08 564.59 638.15 632.46 577 93 508.45 743.22 53.98 55.26 52.53 44.04 36.69 20.51 20.53 7.881.23 3,034.28 3,027.83 2,987.11 2,973.34 2,674.36 2,309.20	30 P		756.19	790.07	784.23	752.65	727.78	635 82	543.30	<u>`</u>
1 357.91 372.56 363.90 357.56 302.17 201.10	35-40	_	637 08	664.59	658.15	622.46	577.93	508.35	415 22	418
. 2,881,23 3,034,28 3,027,83 2,987,11 2,973.34 2,674.36 2,309,20 °	40-45	·	357.91 53.98	372.56 55.26	363.90	44.04	36.69	29.51	26. E.	§ %
	Total	12,	\$81,23	3,034.28	3,027.83	2,987.11	2,973.34	2,674 36	2,309.20	1 2,361

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